CORNELL UNIVERSITY

GRADUATE SCHOOL

1956-1957 AND 1957-1958

CORNELL UNIVERSITY ANNOUNCEMENTS

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CONTENTS

CALENDAR

FALL TERM

	1956–1957	*1957–1958*
Registration (new students, first day)	Sept. 17–18	Sept. 23–24
Instruction begins at 1 p.m.	Sept. 19	Sept. 25
Language examinations in French and German	Sept. 20	Sept. 26
Instruction begins in French and German	Sept. 26	Oct. 2
Last day for filing statement-of-courses form and change-of-committee form and for new students to file candidacy forms	Oct. 2	Oct. 8
Last day for payment of tuition for the term	Oct. 9	Oct. 15
Last day for taking Qualifying and language examinations other than French or German in order to have them considered as of the beginning of the term	Oct. 18	Oct. 24
Thanksgiving recess. Instruction ends at 12:50 p.m.	Nov. 21–25	Nov. 27–Dec. 1
Christmas recess. Instruction ends at 12:50 p.m.	Dec. 22–Jan. 6	Dec. 21–Jan. 5
Last day for completing all requirements for February degrees	Jan. 18	Jan. 24
Term ends	Jan. 30	Feb. 5

SPRING TERM

Registration for old students	Jan. 21	Jan. 27
Registration for new and readmitted students	Feb. 2	Feb. 8
Instruction begins at 8 a.m.	Feb. 4	Feb. 10
Language examinations in French and German	Feb. 5	Feb. 11
Instruction begins in French and German	Feb. 11	Feb. 17
Last day for filing statement-of-courses form and change-of-committee form and for new students to file candidacy forms	Feb. 16	Feb. 22
Last day for filing fellowship and scholarship applications for the following year	Feb. 15	Feb. 14
Last day for payment of tuition for the term	Feb. 25	Mar. 3
Last day for taking Qualifying and language examinations other than French and German to have them considered as of the beginning of the term	Mar. 1	Mar. 7
Spring recess. Instruction ends at 12:50 p.m.	Mar. 23–31	Mar. 29–Apr. 6
Last day for completing all requirements for June degrees	May 24	May 30
Term ends	June 4	June 10
Commencement	June 10	June 16

SUMMER

Summer Research period begins	June 5	June 11
Registration for Summer Session	July 1	July 7
Last day for filing statement-of-courses form and change-of-committee form and for new students to file candidacy forms	July 6 (noon)	July 12 (noon)
Summer Session ends	Aug. 10	Aug. 16
Last day for completing all requirements for September degrees	Sept. 13	Sept. 12
Summer Research period ends	Sept. 21	Sept. 20

ADMINISTRATION

DEANE W. MALOTT, A.B., M.B.A., LL.D., *President of the University*
THEODORE P. WRIGHT, B.S., D.Sc., *Vice President for Research*
JOHN W. MCCONNELL, A.B., Ph.D., *Dean of the Graduate School*
E. HUGH LUCKEY, B.S., M.D., Sc.D., *Associate Dean of the Graduate School of Medical Sciences*
FREDERICK B. AGARD, B.A., M.A., Ph.D., *Secretary of the Graduate Faculty*
MAYFRED STIMMING, B.S. in Ed., *Administrative Secretary*

GENERAL COMMITTEE

Professor TREVOR R. CUYKENDALL, *at large, term expires* 1957
Professor HENRY M. MUNGER, *at large,* 1957
Professor CHANDLER MORSE, *at large,* 1959
Professor GEORGE H. HEALEY, *at large,* 1959

Professor MAX BLACK, *Group I (Humanities),* 1957
Professor STUART M. BROWN, *Group I (Humanities),* 1959

Professor ROBIN M. WILLIAMS, JR., *Group II (Social Sciences),* 1957
Professor EDWARD A. LUTZ, *Group II (Social Sciences),* 1959

Professor GUSTAVE A. SWANSON, *Group III (Biological Sciences),* 1957
Professor GRACE STEININGER, *Group III (Biological Sciences),* 1959

Professor PAUL J. FLORY, *Group IV (Physical Sciences),* 1957
Professor GEORGE WINTER, *Group IV (Physical Sciences),* 1959

THE SECRETARY OF THE FACULTY, *ex officio*
THE DEAN, *Chairman ex officio*

The office of the Graduate School is in Edmund Ezra Day Hall, Room 125. The office hours are 8:30 a.m. to 4:00 p.m. Monday through Friday and 8:30 a.m. to 12:15 p.m. on Saturday (except during the summer).

THE GRADUATE SCHOOL

THE GRADUATE SCHOOL of Cornell University has jurisdiction over "all graduate work and any degree beyond the first degrees given by any college or school."* It offers its students facilities for advanced study and research and assists them in obtaining a comprehensive view of a field of knowledge, together with the training required for independent investigation. It encourages them to associate freely with mature scholars who will give them the aid and direction they need. It expects to attain its end less through imposing an elaborate system of requirements than through developing a sense of responsibility for the advancement and wise application of knowledge.

The Graduate School recognizes a difference in administration and purpose between two types of advanced degrees: *General* and *Professional.*

GENERAL DEGREES†

MASTER OF ARTS, MASTER OF SCIENCE, DOCTOR OF PHILOSOPHY

The Graduate School itself, and not a college or departmental group, administers and confers these degrees. It imposes few requirements, permits great latitude to the individual in choice of studies, and expects each candidate to utilize all resources of the University relevant to his work. It emphasizes an essentially scientific training, a pursuit of truth as an end in itself rather than as a by-product of professional attainment.

The following sections relate less to the organization and routine upon which the Graduate School relies to secure these results‡ than to

*On the recommendation of the Graduate Faculty, the Board of Trustees has established the Graduate School of Medical Sciences in New York City. With the annual approval of the Graduate Faculty, the Faculty in New York City exercises complete jurisdiction over graduate instruction in that School, including programs leading to the degrees of Master of Science and Doctor of Philosophy. Because of the separate jurisdiction, this *Announcement* does not describe instruction in the Graduate School of Medical Sciences; inquirers interested in the instructional programs of that School should address the Associate Dean of the Graduate School, Cornell University Medical College, 1300 York Avenue, New York 21, N.Y., or write to that office for the *Announcement of the Graduate School of Medical Sciences.*

†For professional degrees, see p. 18.

‡These matters are described in detail in a *Code of Legislation,* copies of which are furnished to enrolled students and are available for consultation in academic and administrative offices of the University.

practical situations the student may encounter in beginning and carrying on his work.

ADMISSION

To be admitted, an applicant (1) must hold a Bachelor's degree from a college or university of recognized standing, or must have done work equivalent to that required for such a degree; (2) must have had adequate preparation in the chosen Field of Instruction; and (3) as judged by his previous scholastic record or other achievements, must show promise of doing well in advanced study and research. But the Graduate School may have to refuse a satisfactory applicant if the Field of his choice has no place for him. Hence, the Admissions Committee cannot give assurance that an application for the fall term received after February 15, or for the Summer Session after May 1, will receive the same consideration it might have been accorded at an earlier date.

Inquiries should be addressed to The Graduate School, Edmund Ezra Day Hall, Cornell University, Ithaca, N.Y. The School will furnish a form specifying what information and credentials are considered necessary. Since acceptance will be delayed until all such material has come in, recommendations and transcripts should follow the application as speedily as possible.

Applicants in the following fields must include in their credentials the results of the Graduate Record Examination (Aptitude Test): Economics (Aptitude *and* Advanced Tests), Geology and Geography, History, Industrial and Labor Relations, Music, and Zoology. Although the examination is not required in other Fields, the Admissions Committee welcomes submission of results and finds them helpful in acting upon the application. If for satisfactory reasons a person cannot take the examination before he wishes his application acted upon, the Admissions Committee may act provisionally, pending submission of scores at a later date. For information about the Graduate Record Examination, address the Educational Testing Service, 20 Nassau Street, Princeton, N.J.

Uncompleted files will be destroyed after one year; applications refused or temporarily withdrawn will be destroyed after three years unless the sender requests reconsideration.

When admitted, an applicant will ordinarily be enrolled as a candidate for a designated degree with his major work in a designated field. But at times the Admissions Committee may find reason to admit him to provisional status with the opportunity of transferring to candidacy after a trial period.

A student who wishes to change his status from noncandidacy or provisional candidacy to regular candidacy, or who, after receiving the Master's degree, wishes to undertake candidacy for the doctorate, must

request the Dean of the Graduate School in writing to transfer him to the new status. He need not duplicate his original application or credentials, or submit further credentials unless the Field concerned requires them; but as soon as possible after approval of the transfer, he must file a new nomination-of-committee statement.

DUPLICATION OF DEGREES

The Graduate Faculty receives occasional inquiries regarding candidacy for a second Master's or a second Doctor's degree, usually because the inquirer wishes to take major work in another field. Since the primary purpose of programs leading to advanced general degrees is acquirement of method and not acquirement of specific knowledge, the Graduate Faculty does not grant a second general degree at the same level. The holder of an advanced degree should consider applying as a noncandidate (see below). In justifiable instances, the holder of an advanced professional degree may become a candidate for an advanced general degree, or vice versa.

REGISTRATION

All graduate students who wish residence credit for any period, including the Summer Session and Summer Research, must register with the Graduate School and with the Registrar at the specified times. Before the fall term, the Registrar notifies each student of an hour at which he is to report, and anyone who does not have notification at least a week before registration day should communicate with the Graduate School. For the spring term, the Registrar notifies only *readmitted* and *new* students; all others should claim registration permit cards at Barton Hall at a time announced in college offices and the *Cornell Sun.*

When registering, the student should report to the table of the Graduate School, not to that of a college. He must register in person, not by proxy. If he cannot appear at the appointed hour, he must report to the Graduate School office as soon as possible, bringing a written explanation endorsed by his Adviser or Chairman. A fee of $5 is required for late registration by matriculated students, not as a fine but as a payment of additional cost to the University for registering a student out of phase.

MAJOR AND MINOR SUBJECTS

Candidates for the degrees of Master of Arts and Master of Science must offer one major and one minor subject; those for the doctorate, one major and two minor subjects. No variation in these numbers is allowed. The possible subjects are listed under the separate Fields of Instruction.

The standards of attainment for each subject are fixed by the member of the Faculty who represents the subject on the Special Committee; he requires whatever in his judgment is necessary for proper training, including attendance in courses and seminars, as well as supervised or independent study. Since he will adjust the work to the candidate's preparation and interests, programs of persons registered in the same subject may differ greatly.

Within two weeks of first registration (one week for Summer Session) and after consultation with members of the Faculty, a candidate must notify the Graduate School of his selection of major and minor subjects. Thereafter, he may change subjects whenever a change appears feasible or beneficial; but he must secure the approval of the Special Committee and immediately report the details to the Graduate School for approval there.

SPECIAL COMMITTEES

Every candidate works under the direction of a Special Committee which he selects himself. Its members may be professors, associate professors, or assistant professors, or instructors who hold the Doctor's degree and have as their primary work teaching and research on the Ithaca campus. The Chairman is the representative of the major subject. He and the other members express their willingness to serve by signing the record of major and minor subjects, which the candidate files at the Graduate School. If a candidate wishes, he may invite *two* persons to represent a single major or minor subject.*

If he finds it necessary to make subsequent changes in the membership of the Committee, he must secure the approval of all members of the newly constituted Special Committee and of the Dean.

The members of the Special Committee decide what the candidate may profitably do, whether he is making satisfactory progress, and whether he deserves the award of the degree. They conduct and report on all examinations not part of course work, and approve and accept the thesis. They and the candidate constitute an independent working unit, not subject to outside review unless the members request it.

The candidate himself, however, must accept full responsibility for meeting the requirements of the Graduate School enumerated below.

RESIDENCE

The Graduate Faculty regards study in residence as essential. For although a person working off campus may attain considerable proficiency in a technique or even in a narrow field of knowledge, he may fail in other ways to become such a representative as the School hopes to produce. He needs the acquaintance, company, aid, and stimulus of

*One of these may be on the staff of the Agricultural Experiment Station at Geneva. For work at the Geneva Station, see pp. 37.

others engaged in work like his own; he should form the habit of attending lectures and recitals and the meetings of groups in whose activities he takes interest. And he would be remarkably fortunate if he could gain more than a highly specialized knowledge of his subject without the libraries and laboratories of the University.

The Faculty therefore requires that the record of each candidate for a Master's degree show two units of residence, that of each candidate for the Doctorate six units. Special Committees will recommend a "unit" when in their opinion the student has satisfactorily completed an entire fall or spring term in residence and full-time study. For shorter periods, for instance, the Summer Session or Summer Research, or for study that does not occupy his full time, the Committee may recommend an appropriate fraction of a unit, as specified in the *Code of Legislation.* But as a rule the Graduate School will not permit anyone to receive credit for more than two units in any period of twelve consecutive months.

TRANSFER OF RESIDENCE...Candidates for the Master's degree may not count study in other graduate schools as part of their residence, but are allowed to claim credit for two-fifths of a unit for previous work in the Cornell Summer Session. Candidates for the Doctorate are usually permitted to count study elsewhere for the Master's degree as equivalent to two residence units; and those who have received training of an exceptional quality and amount may petition for more. But no commitment regarding this may be made until after the student has entered into residence and his Special Committee has had further opportunity to judge his accomplishments. The residence transferred cannot exceed that which would have been earned under similar circumstances at Cornell. Credits secured during study as an undergraduate, even for work in courses designed primarily or wholly for graduate students, will not be allowed.

A candidate for the Doctorate must complete two of the last four units in successive terms of study on the Cornell campus.

SUMMER RESEARCH...Under regulations appearing in the *Code of Legislation,* a candidate who has registered for and completed satisfactory work in Summer Research may receive credit for an additional half unit of residence (in exceptional cases, three-fourths of a unit).

SUMMER SESSION...To receive two-fifths of a unit for work in the Summer Session, the candidate must register in both the Session and the Graduate School and must file a statement of courses satisfactory to his Special Committee. By arrangement with his Committee, he may secure all his residence for the Master's degree by attending Summer Sessions. Except in unusual cases, a candidate for the Doctorate may earn no more than two units for work done in summers.

DIVISION OF EXTRAMURAL COURSES...Under published regulations, Master's degree candidates employed within and outside the University may be granted as much as one residence unit, and doctoral candidates as much as two units, for work in the Division of Extramural Courses, which offers instruction in certain Fields both on and off the campus.

CONTINUITY...A candidate is expected to register each fall or spring term until he has completed his residence; if he finds this impossible, he must apply for a leave of absence from the Graduate School. He must complete all requirements for the degree between first registration and a date ten years later.

A candidate who wishes reinstatement after failing to register for a term informs the Graduate School in writing of the details of his case. If he has not registered during the preceding four years, he will be permitted to re-enroll only after the School has stipulated what previous residence units he may retain.

LANGUAGES

Candidates required by Fields or by the Graduate School to demonstrate ability in reading a foreign language must pass a general written examination. It is offered on the second day of classes during each session and will consist of translating a brief passage of representative prose in the student's general field. The use of a dictionary will be permitted. The examiners will mark the performance "pass" or "fail." Those who pass during their work for a Cornell Master's degree need not be re-examined in connection with the Doctorate; all others must pass the examination.

Candidates who take examinations in languages other than French or German should arrange with the Graduate School for assignment to a suitable examiner and will be allowed one month in which to satisfy the requirements.

INSTRUCTION IN FRENCH AND GERMAN...Courses designed to aid graduate students in reading French and German at a level of facility adequate for accurate research are given by the Division of Modern Languages in cooperation with the Graduate Faculty. There are four term-courses—one at the elementary and one at the intermediate level in each of the languages. Anyone registering for them is expected to attend regularly throughout the term, take all examinations, and complete assigned work; and at the end, he receives a mark which appears on his transcript. Pressure of other work, however severe or unexpected, will not be considered a sufficient excuse to justify cancellation or withdrawal in order to avoid a failing grade.

ELEMENTARY FRENCH OR GERMAN 151. Credit 3 hours. M W F (time to be announced).

INTERMEDIATE FRENCH OR GERMAN 152. Credit 3 hours. M W F (time to be announced).

FOR THE MASTERS' DEGREES...Each Field of Instruction states its requirements in its own section of this *Announcement*. If *college entrance language* is specified, the candidate's transcript of record must indicate that he has passed three college entrance units in one language, or two units in each of two languages, or the equivalent in college study. If *proficiency* is specified, the candidate must take and pass the examination described above. Each Field has established and announced the penalty for failure.

Any Special Committee may, in its discretion, require knowledge of foreign language beyond the announced requirements.

FOR THE DOCTORATE...Every candidate whose native language is English must pass examinations in reading French and German, except that another language may be substituted for one or both of these if the Special Committee attests to the Dean that the relative amount, quality, and pertinence of scholarly or scientific writing in the candidate's major and minor subjects are superior in the substituted language. The examination in at least one foreign language must be passed immediately upon admission to candidacy; otherwise, an additional semester of residence is required. The additional semester may be waived by the General Committee of the Graduate School upon recommendation of the student's Special Committee if preparation in foreign language is made during a period when the candidate is not receiving credit for residence.

A candidate should complete requirements for the second foreign language as soon as possible in order to maximize its usefulness in his research. In any case, two units of residence will be required after this examination has been passed.

A foreign student whose native language is not English may substitute English for one of the two required languages. He may not be required to take an examination, but he should obtain certification from the Chairman of his Special Committee that he has the necessary acquaintance with English.

COURSES AND REGISTRATION IN COURSES

Graduate students have the privilege of registering in any University course which can accommodate them, no matter whether it is announced as primarily for graduates or undergraduates. They will find details regarding all offerings in the *Announcements* of the various colleges; and to guide them to the right publication, the name of the

college that lists the material has been placed after the name of the Field of Instruction (see below, pp. 41–85).

The Graduate School itself imposes no course requirements whatever. It does not regard the accumulation of credit hours as an index of the student's progress or as in any measure a guaranty that he will receive the degree. It leaves to him and the Special Committee all decisions as to which subjects he should pursue in courses and whether he has profited as he should from the work.

For the convenience of all, however, the Graduate School does require that the instructor in each course submit a grade to be entered upon the student's record; and to prevent exclusion from courses with limited enrollment, it permits a student in residence to preregister for these at an announced time during the term preceding that in which they will be offered. New students ordinarily need not preregister, but for those who expect to take laboratory courses with limited facilities, it may be advisable to consult with their Field Representative or major adviser.

EXAMINATIONS

The Special Committee conducts all examinations not part of course work, but the candidate is responsible for seeing that the final examinations are scheduled with the Graduate School at least five days in advance. The Committee may invite other members of the Faculty to take part and to join with its members in signing the report to the Graduate School. It may also require other examinations than those listed below.

The following examinations, entirely oral or both oral and written at the discretion of the Special Committee, are required by the Graduate School:

For the Masters' degrees: a final examination which under certain conditions may be combined with the Qualifying Examination.

For the Doctors' degrees: (1) A Qualifying Examination to determine the applicant's fitness for undertaking advanced studies, and to enable the Special Committee to plan a program which will make him familiar with the requisite knowledge and techniques. An early date for this examination is therefore considered essential, and the Graduate School requires that all candidates complete three units of residence after passing it. (2) A Final Examination. Except by prior arrangement with the Graduate School, this must be taken in two parts—Examination A, given not earlier than the last month of the fourth unit of residence, and at least four months before the second part; and Examination B, on the thesis and related material. Final examination A is announced to the Graduate Faculty so that any member who wishes may attend.

THESIS OR ESSAY

Every candidate for a degree must present a copy of his thesis or essay to the Graduate School and must complete other formalities incidental to making it available in the University Library. In form, it must be as described in other publications of the Graduate School, and it must satisfy the candidate's Special Committee in both scholarship and literary quality.

Since candidates for the Masters' degrees enter upon their work with various aims and considerable variety of preparation, their Special Committees will determine the importance of the thesis in rounding out each individual's program. Some students may use most of their time in attending courses in order to broaden their knowledge; for them the essay may be a secondary consideration. Others may concentrate upon pieces of research best handled in a thesis necessitating expenditure of much of their time and effort; the Special Committee will therefore strive to give such projects a prominent place in planning the candidate's work and in judging his success.

Doctoral theses should demonstrate that, in addition to becoming acquainted with materials and methods, the candidate possesses the ability and technique needed for carrying on original research. The Faculty requires publication by abstract and microfilm.

NONCANDIDATES AND PROVISIONAL CANDIDATES

In addition to administering the general degrees, the Graduate School offers special training to persons with a Bachelor's degree or equivalent preparation. They are admitted in the usual way and work under the supervision of only one member of the Faculty, with the title of Adviser.

If for some reason applicants are not considered to be completely qualified for candidacy, they may be admitted as provisional candidates. Usually they may register for only one term in this status; but upon recommendation of their Advisers and with the approval of the Graduate School, they may reregister once. If later admitted to candidacy, they may petition for transfer of not more than one residence unit, provided they can submit convincing evidence that their work has been of the same quantity and quality as would have been required of candidates.

When staff and facilities are available, the Graduate School will admit a few persons as noncandidates. They differ from the preceding class in that, though wishing additional advanced training, they do not at the moment intend to take another degree. But if later they decide to enter candidacy, they may petition for not more than one residence unit, on the same terms as those applying to provisional candidates. As a rule, they may register as noncandidates for only two terms.

VISITING FELLOWS

Whenever possible, the Faculty welcomes mature scholars who wish to use the facilities of the University to prosecute investigations or to work with the Faculty in the advancement of knowledge. A scientist or scholar who wishes to work on the campus may, upon recommendation of the head of the department in which he wishes to work and endorsement of the College Dean over that department, be given the title of Visiting Fellow by the President, providing he has no formal duties to perform and is paid no salary by the University.

ADVANCED PROFESSIONAL DEGREES*

Advanced professional degrees are designed as preparation and training for a special profession. The admissions, requirements, and curricula for such degrees, as approved by the Graduate Faculty, are announced and administered by the Faculty of a professional school or college, which, for the purpose, acts as a Division of the Graduate Faculty. Degrees are awarded upon recommendation of the Division to the Graduate Faculty. Because of the separate administration, no further information regarding admission or academic requirements for these degrees is included in this *Announcement.* Inquiries addressed to the Graduate School will be forwarded to the proper official. The following professional degrees are approved by the Graduate Faculty:

Master of Architecture (M.Arch.). Advanced training in architectural design, construction, and research. Only graduates of a five-year professional program in architecture are admitted as candidates. (Professor T. W. Mackesey)

Master of Fine Arts (M.F.A.). Advanced training in the practice of painting or sculpture. (Professor J. A. Hartell)

Master of Landscape Architecture (M.L.A.). Advanced training in landscape design. (Professor F. W. Edmondson)

Master of Regional Planning (M.R.P.). Training for a professional career in the fields of city planning or regional planning. (Professor J. W. Reps)

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*The following are advanced degrees which are also first degrees of a school or college and therefore are not subject to the jurisdiction of the Graduate Faculty. For information regarding them, address the school or college indicated:

Bachelor of Laws	Law School
Master of Aeronautical Engineering	Graduate School of Aeronautical Engineering
Master of Business Administration Master of Public Administration	Graduate School of Business and Public Administration
Master of Food Science Master of Nutritional Science	School of Nutrition
Doctor of Medicine	Medical College, New York City
Doctor of Veterinary Medicine	Veterinary College

These degrees are administered by the Division of Architecture and Fine Arts. Inquiries should be addressed to the listed professor.

Master of Laws (LL.M.). This degree is intended primarily for a student who desires to increase his knowledge of the law by working in a specialized field.

Doctor of the Science of Law (J.S.D.). This degree is intended for a student who desires to become a proficient scholar by original investigation into functions, administration, history, and progress of law.

These degrees are administered by the Division of Law.

Master of Education (M.Ed.). This degree is granted upon the satisfactory completion of a program of preparation for professional services in education, such as teaching, administration, student personnel work, and supervision.

Doctor of Education (Ed.D.). The program for this degree is designed to prepare the candidate within a broad cultural context for professional leadership in a selected field of education.

These degrees are administered by the School of Education.

Master of Industrial and Labor Relations (M.I.L.R.). The program leading to this degree provides a basic course of graduate study for those with professional interests in industrial and labor relations and further provides limited opportunities for specialized professional study where broad competence has been established.

This degree is administered by the Division of Industrial and Labor Relations.

Doctor of Science in Veterinary Medicine (D.Sc. in V.M.). This degree is characterized by a professional rather than a general research objective, and it is designed especially for experienced persons in the basic and clinical sciences who need more specific, advanced, scientific, and professional knowledge in order to equip themselves for careers in teaching and research.

This degree is administered by the Division of Veterinary Medicine.

GENERAL INFORMATION

CORNELL UNIVERSITY regularly publishes a pamphlet, *General Information,* which describes the complete educational program of the University.* It will be sent without charge to anyone applying to the Announcements office, Cornell University. The information given below is that part which particularly relates to graduate students.

TUITION AND FEES†

Tuition and fees become due when the student registers. The University allows twenty days of grace in each term, five days in the six-week Summer Session. The last day of grace is printed on the registration coupon which the student is required to present at the Treasurer's office. Any student who fails to pay his tuition charges, other fees, and other indebtedness to the University, or who, if entitled to free tuition, fails to claim it at the Treasurer's office and to pay his other fees within the prescribed period of grace, will be dropped from the University unless the Treasurer has granted him an extension of time to complete payment. The Treasurer is permitted to grant such an extension when, in his judgment, the circumstances of a particular case warrant his doing so. For any such extension the student is charged a fee of $2. A reinstatement fee of $5 is assessed against any student who is permitted to continue or return to classes after being dropped from the University for default in payments. The assessment may be waived in any instance for reasons satisfactory to the Treasurer and the Registrar, when such reasons are set forth in a written statement.

Students registering at any time during the last ten weeks of any term are required to pay tuition at the rate of 10 per cent of the regular tuition of the term for each week or fraction of a week between the day of registration and the last examination day of the term. Students registering at any time during the last five weeks in the short summer courses are required to pay tuition at the rate of 20 per cent of the term's tuition for each week or fraction of a week between the day of registration and the last examination day of the term.

A tuition fee or other fee may be changed by the Trustees at any time without previous notice.

*Detailed descriptions of individual *courses,* however, are given only in the separate *Announcements* (catalogues) of the various colleges and schools (see list on cover).

†This statement is prepared by the Treasurer, who alone is authorized to interpret it.

FEES PAYABLE BY GRADUATE STUDENTS

REGISTRATION DEPOSIT...A deposit of $28 must be made by every applicant for admission after the applicant has received notice of acceptance, unless the candidate has previously matriculated as a student at Cornell University. This deposit is used at the time of first registration to pay the matriculation fee, chest X-ray, and examination-book charge, and covers certain expenses incident to graduation if the student receives a degree. The deposit will not be refunded to any candidate who withdraws his application after May 22 or within 20 days of his admission approval.

TUITION of $150 a term is to be paid by all students registered in the Graduate School with major concentration in subjects within the state-supported colleges‡ of the University; all others must pay tuition of $425 a term. Tuition is payable at the beginning of each term.

Upon recommendation by the appropriate college dean and by action of the Board of Trustees, for each appointment in a state-sponsored school or college, waiver of tuition in the Graduate School may be made to a member of the teaching or scientific staff, whose major field of study is in a state-supported school or college, subject to the following limitations:

(a) If the rate of annual salary for the academic year is not greater than $1700, the tuition fee may be waived entirely;

(b) If the rate of annual salary is greater than $1700 but not greater than $1800, 25% of the tuition will be charged and 75% waived;

(c) If the rate of annual salary for the academic year is greater than $1800 but not greater than $1900, 50% of the tuition will be charged and the balance waived;

(d) If the rate of annual salary for the academic year is greater than $1900 but not greater than $2000, 75% of the tuition will be charged and the balance waived;

(e) If the rate of annual salary is greater than $2000, no waiver will be made.

The word salary as used above means total pay, that is, base pay plus any bonus.

Graduate assistants on the nine- or twelve-month basis who reside here during the summer, who are registered for Summer Research for credit in the Graduate School, and who are required to give service in their department or college during that period may be recommended for waiver of tuition during the summer period under the above limitations. This waiver of tuition does not apply if the student registers in the Summer Session. Those who are engaged only in graduate study and not doing productive work for the department during the summer may not have their tuition waived. The amount of tuition to which the above percentages will be applied is the prorated amount of the full tuition fee based upon the maximum amount of residence units that can be earned.

A regularly appointed member of the teaching or scientific staff registered in the Graduate School, whose appointment does not carry free tuition, shall pay tuition at the rate of three-quarters of the tuition regularly charged full-time students, unless arrangements have been made in advance with the Dean of the Graduate School whereby such student is to receive less than three-quarters of full residence credit because of his appointment, in which case the student may apply to the Treasurer for proration of tuition on the basis of the maximum residence credit that may be earned.

‡The state-supported colleges are Agriculture, Home Economics, Industrial & Labor Relations, and Veterinary Medicine.

A candidate for the Ph.D. degree whose studies have been satisfactory to the Faculty is exempt from the further payment of tuition upon presenting to the Treasurer at the beginning of each term a certification from the Dean of the Graduate School that the minimum residence requirement for the Ph.D. degree has been completed.

A COLLEGE AND UNIVERSITY FEE of $75 a term, payable at the beginning of each term, is required of all students registered in the Graduate School. This general fee contributes toward the services supplied by the libraries, Clinic and Infirmary, and the student union in Willard Straight Hall, and pays a portion of the extra cost of laboratory courses and general administration.

A graduate student who returns to the University to present his thesis and to take the final examination for an advanced degree, all other work for that degree having been previously completed, shall register as a "candidate for degree only" and shall pay a fee of $35.

A THESIS FEE of $30 is required of each doctoral candidate at the time of depositing the approved thesis and abstract in final form. This fee covers the cost of preparing a master microfilm of the entire thesis; of publishing the abstract in the bimonthly periodical, *Dissertation Abstracts;* of mailing the thesis and abstract to and from the microfilm publisher; and of binding both copies of the thesis for deposit in the University Library.

REFUNDS of tuition and other fixed fees will be made to students who withdraw from the University, prior to the completion of a term, for reasons accepted as satisfactory. For students who do not complete a term, tuition and other fees will be charged at the rate of 10 per cent for each week, or fraction of a week, from the first day of registration to the date of withdrawal as certified by the College; provided, however, if withdrawal is made within six days of the date of registration, no charge is assessed. The matriculation fee will not be refunded.

FEES FOR THE SUMMER SESSION. . . Graduate students who attend classes in the Summer Session must register both in the Graduate School and in the Summer Session; they must pay the tuition and fees listed in the *Announcement of the Summer Session.*

SUMMER RESEARCH. . . Students carrying on Summer Research are required to register with the Registrar as well as in the Graduate School office.

Students registered for Summer Research, if they desire residence units for their work, must pay a tuition fee proportionate to the unit period in regular terms. Such students must pay one half ($37.50) of the College and University general fee if the period is eight weeks, or the full fee ($75) if the period is more than eight weeks. Such payment

admits the student to the current Summer Session classes without additional tuition payments, provided that the tuition paid is at least equal to that charged students registered in the Summer Session. Students registered for Summer Research during the summer, not for units, are exempt from the payment of tuition, but may not attend, either as visitors or for subsequent credit, any of the classes or exercises of the Summer Session.

IN ABSENTIA...A graduate student registered in absentia will pay a fee of $35 each term.

MOTOR VEHICLE REGISTRATION AND PARKING FEES... Any student, unless he has the rank of instructor in Cornell University, who owns, maintains, or for his own benefit operates, or has in charge, a motor-driven vehicle in Tompkins County, is required to register his vehicle in person with the Safety Division and to pay a registration fee of $2 a term, unless the vehicle is owned by his parent or guardian who is a resident of Tompkins County. He must present (a) written consent of his parent or guardian if he is under 21 years of age, (b) evidence that the vehicle may be legally driven in New York State, (c) evidence that the operator may legally drive in New York State, and (d) evidence that the vehicle is effectively insured against public liability for personal injury and property damage for the standard minima of $10,000–$20,000–$5,000. This registration, which includes obtaining a registration sticker and paying the fee, must be completed within the registration days at the beginning of the first term if the student is then subject to the rule. If he becomes subject to the rule after that time, he has 48 hours in which to comply with it. Late registration of a vehicle makes the student liable to a fine of $10 and suspension of driving privileges until the case is reviewed by the Committee on Student Conduct.

MOTORCYCLES must be registered but may not be used anywhere on the campus during class hours.

STUDENT PARKING on the campus from 8 a.m. to 5 p.m. is *prohibited.* Exemption may be granted by the Safety Division when the use of the car is essential to the student's attending classes or carrying on his academic or departmental work.

During the Summer Session, the rules are the same.

The student's registration in the University is held to constitute an agreement on his part that he will abide by its rules and regulations with regard to traffic and parking or suffer the penalty prescribed for any violation of them. All privileges here indicated may be denied a student who is not in good standing.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, LOANS

FELLOWSHIPS AND SCHOLARSHIPS

A *fellowship* ordinarily is awarded in open competition to a full-time student proceeding toward a higher degree. The award is made as a tax-exempt gift, and it covers not only tuition and fees but also a substantial contribution toward living expenses during tenure. A student who holds a fellowship is free to select his own research project, and his primary responsibility is to prosecute his studies for his degree. The award of the fellowship does not obligate the holder to render services to the University as an assistant in teaching or otherwise, nor does it commit him in respect to future employment. The holder of a fellowship may not accept any other appointment.

A *scholarship* is likewise a gift and is free from income tax, but the amount of the award usually is less than that of a fellowship. It generally covers expenses such as tuition and fees (or similar cash grant) without a material contribution to living expenses. The holder of a scholarship may, on approval of the Fellowship Board, accept another appointment.

The stipends of fellowships and scholarships are payable at the office of the Treasurer of the University in eight or twelve equal installments, with the first payment due October 5 and the other payments due on the fifth of each succeeding month.

Applications for fellowships or scholarships are made to the Graduate School, 125 Edmund Ezra Day Hall, Cornell University, on forms obtained from that office. The applicant either must be a matriculated student in the Graduate School or must have filed an application for admission, with necessary credentials. Filing application for admission does not obligate the applicant. *The applications for admission and fellowship or scholarship should be filed simultaneously.*

Under the rules of the Association of Graduate Schools, the regular time for notification of award of fellowships and scholarships for an academic year is April 1. *All fellowship and scholarship applications received by February 15 will be considered for April 1 awards, and on that day each applicant will be notified as to whether he has or has not been appointed or named as an alternate for a fellowship or scholarship.* The applicant is allowed until April 15 to notify the Graduate School whether or not he will accept the award. Applications received after February 15 may be considered at a later date if vacancies occur due to withdrawal of principals and alternates or for other reasons. Fellowships and scholarships are usually granted for an academic year, but under some conditions may be awarded for a single semester or for a Summer Research period.

The fellowships and scholarships available for 1956–1957 and 1957–

1958 are listed below.* Tuition for the academic year for students whose major work is in Fields of the *endowed* institutions is $850, and for students whose major work is in Fields of the *state* institutions, it is $300. In addition to the fellowships and scholarships listed below, a reference list of those available outside the University is maintained at the Graduate School office.

FELLOWSHIPS AND SCHOLARSHIPS OPEN TO CANDIDATES IN ALL FIELDS

Cornell University Senior Graduate Fellowships (four) $2250–$2800
Stipend $1800, tuition $300 or $850, fees $150. For candidates near the completion of study for the doctorate. A travel allowance may be granted in place of tuition and fees.

Cornell University Junior Graduate Fellowships (twenty) $1850–$2400
Stipend $1400, tuition $300 or $850, fees $150. Primarily for new students.

Allen Seymour Olmsted Fellowships (two) $1850–$2400
Stipend $1400, tuition $300 or $850, fees $150. Primarily for new students.

Glasgow University Exchange Fellowship
Tuition, board, room, and an allowance of $380 for travel. Limited to matriculated students for one year of study at Glasgow University.

Tuition Scholarships (thirty) $300 or $850
For new or matriculated students. A statement of financial need is required.

Travel Grant $300
Preference given to the Field of History.

HUMANITIES

ARCHITECTURE

University Scholarship $1250
Stipend $250, tuition $850, fees $150. Open to candidates in Fields of Architecture, Landscape Architecture, Fine Arts, and City and Regional Planning.

Francke Huntington Bosworth Memorial Fellowship $1000
Stipend $1000, no tuition or fees. Open to graduate students in Landscape Architecture.

E. Gordon Davis Memorial Fellowship $1000
Stipend $1000, no tuition or fees. Open to graduate students in Landscape Architecture.

CLASSICS

University Fellowship $1800
Stipend $800, tuition $850, fees $150

University Scholarships (two) $1200
Stipend $200, tuition $850, fees $150

ENGLISH LANGUAGE AND LITERATURE

Martin Sampson Teaching Fellowship $1250 plus part-time assistantship
Stipend $250 (plus assistantship salary), tuition $850, fees $150

PHILOSOPHY

Susan Linn Sage Fellowships (two) $1750
Stipend $750, tuition $850, fees $150

ROMANCE STUDIES

University Fellowship $1650
Stipend $650, tuition $850, fees $150 (not available in 1957–1958)

*The Special Temporary Fellowships are marked with an asterisk, and their listing is based on their availability in 1955–1956.

SOCIAL SCIENCES

OPEN TO MORE THAN ONE FIELD

Southeast Asia Training Fellowships (two) $2200
Stipend $1200, tuition $850, fees $150. Open to candidates participating in the Southeast Asia Program. Apply to Director, Southeast Asia Program, Morrill Hall.

Henry Strong Denison Fellowship in Agriculture $1300
See BIOLOGICAL SCIENCES

Clinton DeWitt Smith Fellowship in Agriculture $1100
See BIOLOGICAL SCIENCES

Anna Cora Smith Scholarship in Home Economics $700
Stipend $250, tuition $300, fees $150. Open to candidates in all Home Economics Fields.

Tsing Hua University Research Scholarship in Chinese Culture $1500
Stipend $500, tuition $850, fees $150. Open to candidates in the Southeast Asia and China Programs. Apply to Director, Southeast Asia Program, Morrill Hall, or Director, China Program, Morrill Hall.

ANTHROPOLOGY

Cornell Sigma Xi Fellowship $1650 or $2200
Stipend $1200, tuition $300 or $850, fees $150. Also open to candidates in the Areas of the BIOLOGICAL SCIENCES and the PHYSICAL SCIENCES. May not be available in 1956–1957.

BUSINESS AND PUBLIC ADMINISTRATION

A number of fellowships and scholarships are available each year for candidates for the Ph.D. degree, ranging in stipend from $500 to $3000. Tuition and fees are not included.

CHILD DEVELOPMENT AND FAMILY RELATIONSHIPS

**Grant Foundation Fellowships in Family Life Education* (two or three) $2000–$2500
Stipend $1550–$2050, tuition $300, fees $150

ECONOMICS

President White Fellowship $1850
Stipend $850, tuition $850, fees $150

EDUCATION AND RURAL EDUCATION

**Elementary Teacher Training Fellowships* (fourteen) $1800
Stipend $800, tuition $850, fees $150. Open to graduates of liberal arts colleges without professional training or teaching experience who wish to study for the M.Ed. degree. Apply to Professor Claude L. Kulp, Rand Hall. May not be available in 1957–1958.

**DuPont Fellowships in Mathematics and Science Teaching* (two) $1650
Stipend $1200, tuition $450, fees $150. Open to graduates of liberal arts colleges who are seeking preparation for high school teaching.

Shell Fellowship in Mathematics and Science Teaching $1950 or $2500
Stipend $1500, tuition $300 or $850, fees $150. Preference given to doctoral candidates.

Comstock Scholarship in Nature Study $450
No stipend, tuition $300, fees $150

E. Lawrence Palmer Scholarship $50
Stipend $50, no tuition or fees

HISTORY

President White Fellowship $1950
Stipend $950, tuition $850, fees $150

George C. Boldt Fellowship $1850
Stipend $850, tuition $850, fees $150

Newton C. Farr Fellowship $2400
Stipend $1400, tuition $850, fees $150. For the study of American institutions and history. Fellow will work under the John L. Senior Professor.

Gertrude A. Gillmore Research Fellowship $1500 (Plus tuition if needed)
Stipend $1500 (tuition $850). Open to women students who are ordinarily in their last year of work for the doctorate.

INDUSTRIAL AND LABOR RELATIONS

Tuition Scholarships (four) $300

BIOLOGICAL SCIENCES

OPEN TO MORE THAN ONE FIELD

Cornell Sigma Xi Fellowship $1650 or $2200
Stipend $1200, tuition $300 or $850, fees $150. Also open to candidates in the PHYSICAL SCIENCES and ANTHROPOLOGY. May not be available in 1956–1957.

Henry Strong Denison Fellowships in Agriculture (three) $1300
Stipend $850, tuition $300, fees $150. Open to candidates in plant sciences, animal sciences, and social sciences (agricultural engineering, agricultural economics, rural education, and rural sociology). Preference will be given to those applicants who expect to complete the requirements for the doctorate and who appear most promising from the standpoint of ability to conduct research.

Clinton DeWitt Smith Fellowship in Agriculture $1100
Stipend $650, tuition $300, fees $150. Open to students who come from farm homes and who have had farm training. Not available in 1957–1958.

Schyler-Gage Fellowship in Animal Biology $1650 or $2200
Stipend $1200, tuition $300 or $850, fees $150. Open to candidates in the Fields of Biochemistry, Conservation, Entomology, and Zoology.

**Shell Fellowship in Plant Science* $1950
Stipend $1500, tuition $300 (if needed), fees $150

**Allied Chemical & Dye Fellowship in Entomology or Plant Pathology* $1950 or $2450
Stipend $1500 (single), $2000 (married), tuition $300 (if needed), fees $150. Available to candidates in the Field of Entomology in 1956–1957 and candidates in the Field of Plant Pathology in 1957–1958.

Woods Hole Scholarships (two) $120
Stipend $120 to be used to cover tuition for a six-week summer session at the Marine Biological Laboratory, Woods Hole, Massachusetts.

ANIMAL HUSBANDRY

Morrison Fellowship in Livestock Feeding $1450
Stipend $1000, tuition $300, fees $150

CONSERVATION

Albert R. Brand Fellowship in Ornithology & Biological Acoustics $1650
Stipend $1200, tuition $300, fees $150

ENTOMOLOGY

Comstock Scholarship in Entomology $450
No stipend, tuition $300, fees $150

PSYCHOLOGY

Susan Linn Sage Fellowship $1450
Stipend $450, tuition $850, fees $150

Dallenbach Fellowship $2200
Stipend $1200, tuition $850, fees $150. May not be available until 1959–1960.

PHYSICAL SCIENCES

Open to More than One Field

Cornell Sigma Xi Fellowship $1650 or $2200
Stipend $1200, tuition $300 or $850, fees $150. Also open to candidates in the Biological Sciences and Anthropology. May not be available in 1956–1957.

**Cornell Aeronautical Laboratory Fellowships* (one or two) $2500
Stipend $1500, tuition $850, fees $150. May not be available.

Hannibal Ford Fellowship $3500
Stipend $2500, tuition $850, fees $150. Available to students who are American citizens in their first year of graduate study, or to those who have completed no more than a limited amount of auxiliary study at the graduate level in electrical or mechanical engineering, engineering physics, or mechanics and materials. For further information write for *Financial Aids and Scholarships,* Announcements Office, Day Hall.

I. B. M. Fellowship in Electrical Engineering or Physics $2500
Stipend $1500, tuition $850, fees $150. Preference given to students interested in computational devices and techniques.

John McMullen Graduate Scholarships or Fellowships (ten) up to $2400
Stipend $500–$1400, tuition $850, fees $150. Open to candidates in all Fields of Engineering. Apply to the Dean, College of Engineering, Sibley Dome. For further information write for *Financial Aids and Scholarships,* as listed above.

Aeronautical Engineering

**Avco Manufacturing Corporation Fellowship* $2500
Stipend $1500, tuition $850, fees $150

**Curtiss-Wright Fellowship* $2500
Stipend $1500, tuition $850, fees $150

**Fairchild Engine & Aeroplane Corporation Fellowship* $2500
Stipend $1500, tuition $850, fees $150

**Grumman Corporation Fellowship* $2500
Stipend $1500, tuition $850, fees $150

Chemical Engineering

**DuPont Company Postgraduate Fellowship* $2200–$3100
Stipend $1200 (1st yr. grad.), $1500 (2nd yr. grad.), $600 (additional if married), tuition $850, fees $150.

**Standard Oil of Indiana Fellowship* $2200–$2500
Stipend $1200 (1st yr. grad.), $1500 (2nd yr. grad.), tuition $850, fees $150

**Visking Corporation Fellowship* $2500
Stipend $1500, tuition $850, fees $150. Not available in 1956–1957.

**School of Chemical and Metallurgical Engineering Scholarship* $1500
Stipend $500, tuition $850 (may be added to stipend), fees $150

Chemistry†

Sage Fellowships for Summer Research (two) $512.50
Stipend $300, tuition $212.50, no fees

Schluederberg Fellowship for Summer Research $512.50
Stipend $300, tuition $212.50, no fees

John E. Teeple Fellowships for Summer Research (four) $512.50
Stipend $300, tuition $212.50, no fees

**American Viscose Corp. Summer Research Fellowships* (five) $537.50
Stipend $325, tuition $212.50, no fees.

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†Further Summer Research Fellowships in Chemistry were supported in 1955 from the grants-in-aid of the DuPont Company and the Shell Companies Foundation.

**Procter and Gamble Company Summer Research Fellowships* (five to seven) $562.50
Stipend $350, tuition $212.50 (if necessary), no fees

**Allied Chemical & Dye Corporation Fellowship* $2500 or $3000
Stipend $1500 (single), $2000 (married), tuition $850, fees $150

**Eastman Kodak Fellowship* $2400 or $3100
Stipend $1400 (single), $2100 (married—with children), tuition $850, fees $150

**General Electric Fellowship* $2750, $3100, or $3500
Stipend $1750 (single), $2100 (married), $2500 (married—with children), tuition $850, fees $150

**Procter and Gamble Company Fellowship* $2400 or $3100
Stipend $1400 (single), $2100 (married), tuition $850, fees $150

**U.S. Rubber Fellowship* $2400 or $3100
Stipend $1400 (single), $2100 (married) tuition $850, fees $150

**Visking Corporation Fellowship* $2500
Stipend $1500, tuition $850, fees $150. Not available in 1957–1958.

CIVIL ENGINEERING

‡*McGraw Scholarship* $1250
Stipend $250, tuition $850, fees $150

‡*University Scholarship* $1050
Stipend $50, tuition $850, fees $150

‡*Elon Huntington Hooker Scholarship in Hydraulics* $1350
Stipend $350, tuition $850, fees $150

**Armco Drainage & Metal Products Scholarship* $1800
Stipend $800, tuition $850, fees $150

**New York State Bituminous Concrete Association Scholarship* $1800
Stipend $800, tuition $850, fees $150

ELECTRICAL ENGINEERING

Charles Bull Earle Memorial Scholarship $1250
Stipend $250, tuition $850, fees $150

**Bell Aircraft Corporation Fellowship* $2500
Stipend $1500, tuition $850, fees $150

**General Electric Fellowship* $2500
Stipend $1500, tuition $850, fees $150

**Republic Aviation Corporation Fellowship* $2500
Stipend $1500, tuition $850, fees $150

**Sperry Gyroscope Fellowship* $2500
Stipend $1500, tuition $850, fees $150

ENGINEERING PHYSICS

**Celanese Fellowship* $2800
Stipend $1800, tuition $850, fees $150

**Radio Corporation of America Fellowship* $3100
Stipend $2100, tuition $850, fees $150

GEOLOGY AND GEOGRAPHY

Eleanor Tatum Long Fellowship $2000
Stipend $1000, tuition $850, fees $150

MATHEMATICS

Erastus Brooks Fellowship $1700–$2100
Stipend $700–$1100, tuition $850, fees $150

MECHANICAL ENGINEERING

Edgar J. Meyer Scholarship $1250
Stipend $250, tuition $850, fees $150

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‡The stipends of the McGraw, University, and Hooker Scholarships are augmented by McMullen Scholarship funds to make a stipend of $1000.

Sibley Scholarship $1250
Stipend $250, tuition $850, fees $150

**Ethyl Corporation Fellowship* $2500
Stipend $1500, tuition $850, fees $150

**Standard Oil Company of Ohio* $2250
Stipend $1250, tuition $850, fees $150

**Westinghouse Educational Foundation Fellowship* $1700
Stipend $1700 (out of which tuition and fees must be paid)

PHYSICS

**Corning Glass Predoctoral or Postdoctoral Fellowship* $2800 or $4000
Stipend $1800 (predoctoral), tuition $850, fees $150, or $4000 (postdoctoral), no tuition or fees required.

**Armstrong Cork Fellowship* $2600
Stipend $1500, tuition $850, fees $150, books $100

**General Electric Fellowship* $2750, $3100, or $3500
Stipend $1750 (single), $2100 (married), $2500 (married—with children), tuition $850, fees $150

PRIZES

Seven University prizes are open for competition to all students, including graduate students; the Committee on Prizes of the University Faculty publishes a descriptive list, which may be obtained from the Announcements office, Edmund Ezra Day Hall.

Two other prizes are open exclusively to graduate students:

THE GUILFORD ESSAY PRIZE...Until at least 1962, a special scholarship of $120 will be assigned annually to that graduate student who, in the judgment of the Graduate Faculty, writes the best English prose. Each competitor must submit, at or before 12 o'clock of the last Monday in November, specimens of his English prose, preferably prepared as a normal part of his training in candidacy for an advanced degree.

THE PHILOSOPHY PRIZE...A prize of $50 is awarded to the graduate student who submits the best paper embodying the results of research in the field of philosophy. The subject of the paper may be historical or critical or constructive. It may be concerned either with problems of pure philosophy or with the philosophical bearing of the concepts and methods of the sciences. Papers must be submitted on or before the first day of May.

Papers submitted in competition for either prize must be typewritten (a clean *ribbon* copy), double-spaced, at least 1500 and not more than 5000 words in length, and signed with an assumed name, the real name of the competitor being enclosed in a sealed envelope, superscribed with the assumed name. They are to be deposited in the office of the Graduate School.

LOANS

Contributions from the alumni of Cornell University have made possible the establishment of a Graduate Student Loan Fund for use of graduate students already enrolled in Cornell University in case of financial emergency. Usually a term of successful residence is required before loans are granted. Applications should be made to the office of the Dean of Men and Dean of Women.

ASSISTANTSHIPS AND OTHER EMPLOYMENT

ASSISTANTSHIPS

The colleges, schools, and departments of the University regularly contract for the assistance of graduate students in teaching, research, and administration. The contracting parties and the Faculty of the Graduate School see that appointments and assignment of duties are made with proper consideration for the candidate's graduate program. Usually the duties of the assistant lie in the field of his major interest and contribute to his intellectual and technical proficiency in the field. Assistants are eligible for residence units in candidacy for advanced degrees according to regulations of the Graduate Faculty. Normally an assistant who is called upon for services not exceeding twenty clock-hours a week is eligible for three-fourths of a unit each term, but by earning an additional one-half unit in subsequent Summer Research, he may earn two units in one calendar year. Those desiring appointment should apply to the head of the department concerned. Applications mistakenly addressed to the Graduate School are forwarded to the proper department.

GRADUATE ASSISTANTS IN PERSONNEL

These assistantships are designed for graduate students interested in student personnel administration as a major or minor field. Appointees are given responsibility within the University student personnel program, including residence duties, office experience, or projects of a similar nature. The assistantship for majors is the equivalent of room, board, and tuition. (Apartments are available for married couples in the men's residences.) Applications should be addressed to Professor Isabel Peard, Edmund Ezra Day Hall.

OTHER EMPLOYMENT

Additional opportunities for part-time work are often available in connection with departmental research projects or other activities. Applications for this type of work should be made directly to the department concerned. If a candidate is employed in research or other work closely allied to his academic interest, he may find such employment valuable.

Progress in candidacy is difficult when a student attempts to support himself wholly or partially by work unrelated to his field. It usually is sounder economy to borrow from the Graduate Student Loan Fund and keep employment to a minimum. The University maintains a part-time student employment service, however, in the office of the Dean of Men and Dean of Women.

LIVING ARRANGEMENTS

The University has established Cascadilla Hall as an all-graduate dormitory. The north wing is for graduate women and the south wing is for graduate men. Applications for this dormitory may be made any time after January first for the coming academic year.

Cascadilla is in the southwest corner of the campus, adjacent to a small shopping community, "College Town." One of the original buildings on campus, it has been completely renovated in recent years. On the first floor is a large lounge that is also used for social functions. Student rooms are located on the second, third, and fourth floors. These rooms are spacious, and the furnishings are adequate and comfortable.

Beginning in the fall of 1956, a new 96-unit housing development will be available to married graduate students. This will consist of twelve units, each with eight apartments. Some apartments have one bedroom, some have two, and all are unfurnished.

Room application forms and more detailed information on all types of graduate housing may be obtained by writing the Department of Residential Halls, Edmund Ezra Day Hall.

An off-campus housing office is maintained by the Department of Residential Halls to assist married students and those single students who do not wish to live in a University dormitory.

HEALTH SERVICES AND MEDICAL CARE

These services are centered in the University Clinic (out-patient department) and in the Cornell Infirmary (hospital). Students are entitled to unlimited visits at the Clinic; laboratory and X-ray examinations indicated for diagnosis and treatment; hospitalization in the Infirmary with medical care for a maximum of fourteen days each term and emergency surgical care. (Surgery for the correction of chronic remediable defects and obstetrical services are not included.) The cost for these services is included in the College and University general fee.*

The following health requirements for entering graduate students have been adopted by the Board of Trustees of Cornell University. The Board has also ruled that failure to fulfill these requirements will result in a recommendation to the Registrar that the student be denied the privilege of registering the following term.

(1) *VACCINATION AGAINST SMALLPOX*...A satisfactory certificate of vaccination against smallpox must be filed at the Student Medical Clinic before registration. It will be accepted as satisfactory only if it certifies that within the last three years a successful vaccination has been performed or three unsuccessful vaccination attempts have been made.

*A charge ($3 in the daytime and $5 at night) is made for house calls.

(2) *HEALTH HISTORY*...Students accepted for admission will be required to fill out Cornell student health record forms.

(3) *CHEST X-RAY FILM FOR PERMANENT FILE AT THE INFIRMARY*...This chest film may be made by a private physician within a month of entrance and presented to the Clinical Director at the time of registration; otherwise, a chest radiograph will be made during the orientation period or registration week. A charge of $2 for making this radiograph is included in the registration deposit.

When a student has been away from the University for any reason for more than a year, items (1), (2), and (3) will be required upon reentrance.

COUNSELING

The University maintains a variety of counseling services available to graduate students. The primary academic counselors are the members of the Special Committee. Other counselors, who are able to help in matters involving personal questions, information on part-time employment, financial aid, selective service, graduate activities and program, or occupational advisement and testing, will be found in the office of the Dean of Men and Dean of Women.

PLACEMENT

The University Placement Service makes arrangements for interviews on and off campus with employers, supervises the assembling and presentation of personnel records, and assists Cornell men and women who are ready for positions in business and industry. The Educational Placement Service performs a similar function for those whose vocation is teaching. Many of the professional schools and colleges maintain separate placement offices for the special professions; their services are available to registered graduate students and alumni.

FOREIGN STUDENTS

Applications and all necessary credentials for admission should be filed by foreign students several months before registration day. No student should apply who has not mastered colloquial English.

Before applying, a student from another country should be certain that he has sufficient available funds in dollars to meet all necessary expenses. Because of his unfamiliarity with local patterns of living and buying, he will need to calculate a somewhat higher amount for board, room, and travel than the amounts cited in this *Announcement* and elsewhere. He should, too, make arrangements for additional help in the event of protracted illness or other emergency. Students from foreign countries whose native language is not English or whose preparation differs from that of citizens of the United States should not

expect to receive their degrees at the end of the minimum residence period. Moreover, agencies subsidizing such students should be prepared to support them for a longer period. Such students are usually unable to qualify for assistantships or for other appointments yielding financial assistance.

Within these limits, Cornell University welcomes students from other countries. In 1954–1955, there were 546 students from 69 foreign countries registered in the University. The University maintains on its staff a Counselor to Foreign Students, Donald C. Kerr, whose duty is to look after the welfare of all students from other countries. He may be consulted on personal problems, social questions, or any other matter in which he may be helpful. His office is in Edmund Ezra Day Hall, Room 144. All foreign students should write him before coming to Ithaca or call on him immediately upon arrival.

ACTIVITIES FOR GRADUATE STUDENTS

There are places for graduate students in some extracurricular activities shared by undergraduates, such as intramural sports, drama, publications, music, and the other arts. In the main, however, by reason of maturity and different interests, graduate students have their own organizations. More than twenty-five such organizations center in academic Fields or groups of Fields; some are purely social, others informally academic. As an instance, one club founded in 1907, made up of over one hundred faculty and graduate student members interested in plant breeding and genetics, meets bimonthly for a dinner prepared by its members, after which the members hold an hour's discussion on some topic outside those Fields, led by an invited visitor. Gamma Alpha is the only graduate fraternity which operates its own house, with facilities for both room and board; its membership is limited to students of physical and natural science — broadly interpreted. Other fraternities and sororities limited to graduate students and Faculty are in some instances social, in others academic or honorary. There are general organizations interested in politics, home life, art, etc. The graduate wives' club thrives; in addition to regular meetings for its more than one hundred members, interest groups meet separately.

WILLARD STRAIGHT HALL is the center of social life, both graduate and undergraduate. Supported by University fees included in the tuition and fees listed above, it supplies facilities for graduate groups and plans special functions for them. There is a graduate representative on the Board of Managers.

CORNELL UNITED RELIGIOUS WORK (CURW) includes a range of activities for graduate students. Its offices are in Anabel Taylor Hall, which serves as the headquarters for pastors who represent several denominations and may be consulted by students.

SAGE CHAPEL, where nonsectarian services each Sunday are led by distinguished guest speakers, is maintained by the University. Graduate students are eligible for its trained choir.

CORNELL'S LOCATION in the Finger Lakes region of New York State stimulates outdoor activity. Agencies of the University operate an outdoor swimming pool, a golf course, a ski run with ski tow (twelve miles from the campus), riding classes, and other outdoor facilities. There are three large state parks within ten miles of the campus. Departments of the University plan field trips for various purposes, including ornithological, geological, agricultural, and industrial, which are open to interested graduate students.

RESOURCES FOR RESEARCH AND ADVANCED STUDY

The Graduate School does not conduct programs leading to advanced degrees in fields inadequately equipped for the purposes. Substantial collections and apparatus, in many instances unique, have been assembled for the use of graduate students; they are not described in this *Announcement.*

The descriptions below are limited to major general facilities at the service of graduate students in any of a variety of Fields of Instruction.

OFFICE OF VICE PRESIDENT FOR RESEARCH

Established to aid members of the Faculty in arranging for outside sponsorship, chiefly by industry, government, and foundations, of cooperative research programs of interest and concern to Faculty and their students, this office advised and assisted in administering research projects in the University to the amount of more than twenty-two million dollars during 1954–1955. All phases of human endeavor were represented, the largest being 52.2 per cent in aeronautics (the work of the Cornell Aeronautical Laboratory at Buffalo). The remainder represents substantial research programs in agriculture, medicine and nutrition, the social sciences, the physical and biological sciences, engineering, and the humanities. In addition to these projects aided by outside sponsors, there is a large amount of unsponsored research by departments and individual staff members supported by the University itself as a continuing part of the normal professional activity of its members. The office of the Vice President for Research works closely with the Graduate Faculty in supporting research programs which properly advance the education and training of graduate students, especially with reference to industrially sponsored fellowships.

RESEARCH CENTERS

THE SOCIAL SCIENCE RESEARCH CENTER is an organization designed to encourage and facilitate research in all major fields of the

social sciences on a voluntary basis. Its services are available for social science research by individual Faculty members and organized staff groups in all schools and colleges of the University. Essentially decentralized in its operation, the Center's services include aid in the planning and development of studies, the soliciting of funds from foundations on behalf of individual projects, and direct financial support of limited proportions. With minor exceptions, the Center does not itself provide technical services or maintain a stand-by technical staff but uses its offices to help channel inquiries to appropriate campus agencies and individuals.

Services to graduate students in the past have assumed varied forms. Inquiries concerning the services currently available should be addressed to the Center office. Since the Center is a facilitating rather than an operating agency, graduate students should seek employment opportunities through their departments, where Center-financed or Center-associated projects may be located, rather than through the Center itself. The Center will be happy to provide information concerning the nature and sponsorship of these projects.

The Director of the Center is Professor Chandler Morse, Goldwin Smith Hall.

STATISTICS CENTER...The methods of statistics find important applications in many diverse fields of research. It is therefore necessary that (1) subject matter specialists be able to obtain assistance in using or developing statistical theory, (2) students who intend to do research in a particular field which makes extensive use of statistical methods receive adequate training in statistics, and (3) individuals be trained as statisticians.

The staff members of the various schools and colleges of Cornell University who are interested in the development and application of statistical methods are associated in the Cornell Statistics Center. A major responsibility of the Center is to provide a focal point to which individuals, projects, and departments may come to receive assistance and guidance with respect to the statistical aspects of research and training programs.

The Acting Director of the Center is Professor Philip J. McCarthy, Warren Hall.

HOUSING RESEARCH CENTER...The purpose of the Housing Research Center is to aid and guide basic research in the field of housing, to facilitate graduate study, and to route housing information among colleges and departments and between the University and sources of information off campus. A small central staff facilitates the initiation and conduct of projects.

The facilities of the Housing Research Center are available to Faculty members and graduate students in all Fields. Through the

Center, students who cut across traditional lines of research may draw upon the knowledge and experience of specialists in such various subject areas as design, materials, equipment, structural methods, environment, family living, economics and finance, government, and health.

The Director of the Center is Professor Glenn H. Beyer, Martha Van Rensselaer Hall Annex.

CENTER FOR AERIAL PHOTOGRAPHIC STUDIES...Photographic interpretation has applications in the fields of agriculture, engineering, geology, and city and regional planning. The Center for Aerial Photographic Studies offers a broad program in various scientific fields for training personnel in aerial photographic interpretation. The objectives are, first, to train scientists who will be able to use aerial photographs for surveys and planning in fields where they are needed and, second, through research to extend the use of aerial photographs into all fields which can be benefited.

The Center comprises a staff of educators, scientists, and technicians experienced in research and the application of aerial photographs to their respective fields. The program consists of primary courses in engineering interpretation of aerial photographs, map reproduction, photogrammetry, cartography and map projections, together with specialized study in a particular field of the candidate's choice, such as agricultural development, national resource explorations, city planning, or engineering project planning.

For information about the Center, write to the Director, Center for Aerial Photographic Studies, Lincoln Hall.

NEW YORK STATE AGRICULTURAL EXPERIMENT STATION AT GENEVA...The New York State Agricultural Experiment Station was established in 1880 to promote agriculture through scientific investigations and experimentation. It is located at Geneva, 50 miles from Ithaca, and has been under the administration of Cornell University since 1923.

Professors on the Geneva Staff are eligible to serve as members of the special committees of graduate students along with professors on the Ithaca campus of the University. Normally the graduate training provided at Geneva consists of research experience and the supervision of the student's work on a thesis problem. The formal course work part of the student's training program is given on the Ithaca campus.

The Station is equipped to care for graduate students in certain specific lines of research, viz., bacteriology, chemistry, economic entomology, food technology, plant pathology, pomology, seed investigations, and vegetable crops. Ample facilities are available for graduate research under laboratory, greenhouse, pilot plant, insectary, orchard, and other field conditions.

Certain phases of the investigations now being conducted at the

Station and other problems for which the facilities of the Station are suitable may be used as thesis problems by graduate students.

The Director is Professor A. J. Heinicke, who may be addressed at the New York State Agricultural Experiment Station, Geneva, or at the Plant Science Building, Cornell University, Ithaca.

Students who plan to do part of their graduate work at Geneva should correspond with their major adviser or with the Dean of the Graduate School, concerning regulations as to residence, Special Committees, etc.

THE CORNELL AERONAUTICAL LABORATORY, a separate corporation wholly owned by Cornell University, is in Buffalo, New York. Applied and fundamental research in the aeronautical sciences is conducted in this very completely equipped laboratory under contracts mainly with the military services. Close relationships, both research and educational, are maintained with the campus in Ithaca.

OTHER RESEARCH UNITS...Some other research units allied with the University, either as wholly owned and operated divisions or as wholly or partially autonomous organizations with which the University has a working agreement, are the Sloan-Kettering Cancer Research Institute (in New York City, through the Graduate School of Medical Sciences), the Veterinary Virus Research Institute (at Ithaca), and the Brookhaven National Laboratory (Cornell is one of nine university trustees, under contract with the Atomic Energy Commission).

THE UNIVERSITY LIBRARIES

The University libraries comprise the General Library, Departmental and Seminary Libraries, the Libraries of the Colleges of Agriculture, Engineering, Home Economics, Industrial and Labor Relations, Law, Medicine, and Veterinary Medicine, and special libraries like the Anabel Taylor Library (religion), the Goldwin Smith Library (humanities), and the Library of the Cornell Aeronautical Laboratory. The total current holdings are about a million and three-quarters items. There are also over four million separate manuscript items in the Regional History Collection. The most recent addition to the physical facilities is the Albert R. Mann Library of Agriculture and Home Economics. Cubicles and other study spaces are available for the use of graduate students in the several libraries.

Especially enriched by the early acquisitions of Cornell's first president, Andrew D. White, and by the first librarian, Willard Fiske, the libraries possess special collections of rare books and manuscripts in many of the Fields of graduate study, including unique collections relating to the French Revolution, witchcraft, Dante, Petrarch, China and the orient (Wason), Iceland, American historical documents (Noyes), Brazil, and German literature and philology (Zarncke). There

is a separate rare-book section with a special curatorship. The acquisitions staffs work with graduate students to procure volumes needed for their special studies.

The Collection of Regional History and the Cornell University Archives comprise a manuscript depository which is expanding at the rate of half a million manuscripts a year. These manuscripts relate to all aspects of the economic, political, and social history of this region and areas connected historically with it, and to all aspects of the development of Cornell University. Substantial diplomatic source materials are included in the papers of Jacob Gould Schurman, Willard Straight, Andrew D. White, and other notables. The unique research materials in this division are a challenge to graduate students who are seeking fresh interpretations in their fields of interest. The curator and archivist attempts to acquire manuscripts for the special projects of researchers.

PUBLICATION AND PHOTOGRAPHY

Cornell University Press is the oldest university press in America and is among the leaders in number of volumes published annually. In addition to serving scholars and scientists of the University by publication of results of studies, the staff of the Press, in cooperation with the Graduate School, conducts colloquia on methods and problems of publishing, directed specifically to graduate students.

The extension services of the New York State Colleges, which form integral parts of the University, disseminate knowledge through an intensive program of publication, photography, and recording, supervised by professional staffs. Materials of graduate students may find an outlet through these channels.

The University owns and operates the Photographic Science Laboratory, which is equipped to create or cooperate in the creation of photographic studies and visual aids of all kinds.

FIELDS OF INSTRUCTION

THE FIELDS of Instruction in the Graduate School are listed alphabetically below under the following four Areas: Humanities, Social Sciences, Biological Sciences, and Physical Sciences. For each of the *fields* there are listed the respective faculties, approved major and minor subjects, language requirements for the Master's degree (if any), and special requirements or policies of the *field.*

FIELDS...In most instances the *field* coincides with a department in a college or school. In parentheses immediately following the name of the *field* is given an abbreviation indicating the *Announcement* of a school or college which contains descriptions of courses and seminars offered, as follows: *Ag.,* New York State College of Agriculture; *Arch.,* College of Architecture; *Arts,* College of Arts and Sciences; *Ed.,* School of Education; *Engin.,* College of Engineering; *H.E.,* New York State College of Home Economics; *Hotel,* School of Hotel Administration; *I.L.R.,* New York State School of Industrial and Labor Relations; *Vet.,* New York State Veterinary College. For registration and preregistration of courses, see p. 15.

MAJOR AND MINOR SUBJECTS...For each *field* there is given an approved list of titles from which candidates for advanced general degrees choose major and minor subjects. The numbers 1, 2, 3, 4, 5 have the following meaning:

1, approved as major subject for the Ph.D.

2, approved as major subject for the Master's degree.

3, approved as minor subject when the major is in the same *field.*

4, approved as minor subject when the major is in another *field.*

5, approved as a minor subject for the Master's degree only.

For explanation regarding *language requirements* for the Master's degree, see p. 15.

REPRESENTATIVES...Since instruction in the Graduate School is primarily individual, those interested in becoming students are encouraged to communicate with individual members of the Faculty with whom they may want to study. Personal interviews in advance of formal application for admission are especially encouraged. For the benefit of those who are not acquainted with appropriate members in the *field* or *fields* of their choice, each *field* has selected a *representative* to whom inquiries may be addressed. The *representatives* are designated in the lists of Faculty below by *italics.*

HUMANITIES

HISTORY OF ART AND ARCHAEOLOGY *(ARTS)*

Professors D. L. Finlayson, N. A. Pattillo, A. R. Solomon, *F. O. Waage.*

APPROVED MAJOR AND MINOR SUBJECTS

Archaeology 2, 3, 4

History of Art 2, 3, 4

Language requirement for Master's degree, proficiency in one: French, German, Italian.

Graduate work is offered in the general field of the history of the visual arts (architecture, painting, sculpture, and the minor arts). Instruction is offered through advanced undergraduate courses and through independent study and research under individual direction.

The same conditions will usually apply in the election of work in the general field of archaeology as a major subject; however, relevant courses in such subjects as cultural anthropology may be substituted for some of those in art history, and for graduate work in classical archaeology courses in Latin and Greek may be so substituted.

A half-time assistantship is available. Prospective students interested in applying for this should write directly to the Department of Fine Arts, Goldwin Smith Hall.

CITY AND REGIONAL PLANNING *(ARCH.)*

Professors F. W. Edmondson, *T. W. Mackesey,* J. W. Reps.

APPROVED MAJOR AND MINOR SUBJECTS

City Planning 1, 3, 4

Regional Planning 1, 3, 4

Major study for candidates for the degree of Ph.D. is limited to those who hold the degree of Master of Regional Planning or its equivalent.

THE CLASSICS *(ARTS)*

Professors Charles L. Babcock, Harry Caplan, James Hutton, *G. M. Kirkwood,* Friedrich Solmsen, F. O. Waage.

APPROVED MAJOR AND MINOR SUBJECTS

Latin 1, 2, 3, 4
Medieval and Renaissance Latin Literature 1, 2, 3, 4
Ancient History (see p. 52)
Comparative Indo-European Linguistics 3, 4
Greek 1, 2, 3, 4
Classical Archaeology 2, 3, 4
Classical Rhetoric in original or translation 3, 4
Ancient Thought 3, 4

Language requirement for Master's degree, proficiency in one: French, German.

Admission to graduate study in a subject included in the Field of the Classics, except in archaeology, assumes a knowledge of the field selected equivalent in general to that expected of a student who has pursued the subject concerned throughout four years of undergraduate study in a college of recognized standing.

Graduate work in the classics is conducted in the main by the seminar system, the object of which is training in the methods, the principles, and the performance of independent research and criticism, and the work is therefore as far as possible put

into the hands of the students themselves. Subjects additional to those investigated in the seminar courses are ordinarily treated in courses of lectures. A seminar room in the University Library building is reserved for the exclusive use of graduate students in the classics.

For fellowships in Greek and Latin, see page 25. The income of the Charles Edwin Bennett Fund for Research in the Classical Languages is used each year in the way best suited to promote the object for which the fund was established.

Doctoral dissertations of an appropriate nature will be accepted for publication in the *Cornell Studies in Classical Philology*.

ENGLISH LANGUAGE AND LITERATURE *(ARTS)*

Professors M. H. Abrams, H. Adams, R. M. Adams, G. F. Cronkhite, R. A. Donovan, R. H. Elias, Ruth Fisher, E. G. Fogel, *W. H. French,* B. Hathaway, G. H. Healey, W. R. Keast, L. Lane, R. Langbaum, J. G. Linn, J. A. Mazzeo, F. E. Mineka, A. M. Mizener, D. Novarr, B. Park, S. M. Parrish, E. B. Partridge, W. M. Sale, W. Slatoff, H. W. Thompson.

APPROVED MAJOR AND MINOR SUBJECTS

Medieval Literature 1, 2, 3, 4
Old and Middle English 1, 2, 3, 4
The English Renaissance to 1660 1, 2, 3, 4
The Restoration and the Eighteenth Century 1, 2, 3, 4
The Nineteenth Century and After 1, 2, 3, 4
American Literature 1, 2, 3, 4
English Poetry 1, 2, 3, 4
Dramatic Literature 1, 2, 3, 4
Prose Fiction 1, 2, 3, 4
Folk-Literature 3, 4
Creative Writing 2, 3

Language requirement for Master's degree, proficiency in one: Greek, Latin, French, German, Italian. Candidates failing to demonstrate proficiency on admission will be required to complete two residence units following passing of the examination, unless an exception is made by the Field.

In general, at least thirty-six hours of college English will be required of all applicants; but college work of good quality in allied literatures will sometimes be considered the equivalent of work in English. Training in the Greek and Latin languages and literatures is especially acceptable; and some allowance may be made for advanced work in philosophy or history. Applicants who have taken the Graduate Record Examination (Aptitude and Advanced Tests) should include a transcript of the results; others may submit the rest of the required papers, and will be notified if the Department believes that the scores of the Examination may affect their chances of acceptance. Applicants for the Doctorate will be admitted as provisional candidates under the supervision of the Chairman of the Department.

For the Master's degree there are no special requirements in courses or subjects; in all matters of schedule, the candidate's Special Committee is the final authority and will help him select a profitable program.

Provisional candidates for the Doctor's degree must take a qualifying examination given by the staff during the first month of residence, and, if successful, they will be transferred to candidacy as of the first of the term. For information regarding details, they may apply to the Chairman of the Department. Before receiving the degree, candidates must demonstrate a knowledge of Old English, both the language and the literature.

During the period from July to September, members of the staff will not ordinarily advise candidates or supervise Summer Research.

In addition to the Martin Sampson Fellowship, the Department awards several part-time teaching positions to candidates for advanced degrees.

GERMAN *(ARTS)*

Professors E. KAHLER, *V. Lange,* I. LORAM, W. G. MOULTON.

APPROVED MAJOR AND MINOR SUBJECTS

German Literature 1, 2, 3, 4 Germanic Linguistics 1, 2, 3, 4

In the advanced courses in this field the work is twofold: literary and linguistic. The history of German literature from the earliest period to the present day is treated in lecture courses with collateral reading. Special topics are selected for detailed study, such as the epic and lyric poetry of the Middle High German period, the literature of the Baroque period, the age of Goethe, the drama of the nineteenth century, and contemporary literature. The courses offered in German linguistics include the study of Gothic, Old Saxon, and Old and Middle High German; they also afford an introduction to the methods of descriptive, historical, and comparative linguistics as applied to Germanic languages. The seminar in German literature aims to impart the principles and methods of investigation, a knowledge of the bibliographical resources, and a familiarity with the theories of literary criticism.

Candidates for the Ph.D. with a major in German literature must select Germanic linguistics as one of their minors; candidates for the Ph.D. with a major in Germanic linguistics must select German literature as one of their minors. Candidates for advanced degrees in German are expected to have an adequate knowledge of French and Latin.

MUSIC *(ARTS)*

Professors W. W. AUSTIN, *D. J. Grout,* R. L. HULL, K. HUSA, J. KIRKPATRICK, R. M. PALMER.

APPROVED MAJOR AND MINOR SUBJECTS

Musical Composition 2, 3, 4 Musicology 1, 2, 3, 4

Theory of Music 2, 3, 4

Language requirement for Master's degree: for majors in musicology, proficiency in French and German; for majors in composition or theory, proficiency in French or German.

Candidates are expected to take active interest in musical performance. All candidates are tested for musical proficiency: singing and playing unfamiliar music at sight, score reading, and fluency at the keyboard; on the basis of these tests, students may be advised to enroll in undergraduate courses or to undertake extracurricular work in musical practice and theory. Choral and orchestral organizations of the University and the community welcome graduate students and their wives or husbands as members.

Normally students whose major subject is theory or composition choose musicology as a minor subject, and vice versa. Doctoral candidates choose a second minor subject in a related field. It is especially important for doctoral candidates to equip themselves with a good reading knowledge of both French and German as early as possible.

A large microfilm collection of Renaissance music and music theory is available to qualified candidates working in this Field.

SUSAN LINN SAGE SCHOOL OF PHILOSOPHY *(ARTS)*

Professors R. ALBRITTON, MAX BLACK, S. M. BROWN, JR., E. A. BURTT, R. G. HENSON, J. H. HICK, *Norman Malcolm,* JOHN RAWLS, DAVID SACHS, H. R. SMART.

The Susan Linn Sage School of Philosophy was founded through the generosity

of the late Henry W. Sage, who endowed the Susan Linn Sage Professorship and gave in addition $200,000 to provide permanently for instruction and research in philosophy.

The Philosophical Review, supported by the University and issued under the auspices of the Sage School, is a quarterly journal devoted to the interests of philosophy, including logic, metaphysics, ethics, aesthetics, the history of philosophy, and the philosophy of religion. By the terms of its establishment, *The Review* is an absolutely free organ of philosophical scholarship, not devoted to the propagation of any doctrine.

APPROVED MAJOR AND MINOR SUBJECTS

Aesthetics 1, 2, 3, 4
Epistemology 1, 2, 3, 4
Ethics 1, 2, 3, 4
History of Philosophy 1, 2, 3, 4
Logic 1, 2, 3, 4
Metaphysics 1, 2, 3, 4
Philosophy 4
Philosophy of Religion 1, 2, 3, 4
Political Philosophy 1, 2, 3, 4

Language requirement for Master's degree: three college entrance units or proficiency in French or German.

The instruction offered to graduate students presupposes such undergraduate courses in the subject as would be taken by a student in the College of Arts and Sciences of Cornell University who had elected philosophy as a major subject. Those who have not had equivalent preparation are expected to make up their deficiencies outside the work required for an advanced degree.

The Sage School provides opportunity for advanced study to two classes of graduate students: (1) those whose major interest is in some branch of philosophy; (2) those whose chief branch of research is in allied fields but who desire to supplement this with a minor in philosophy.

1. Students whose major interest is in philosophy are required (a) to gain a general knowledge of the whole subject including its history, and (b) to select some aspect or subdivision of it for intensive study and research.

2. Graduate students having a major interest in literature or the arts, in history or social studies, or in mathematics or a branch of experimental science, are permitted to choose a minor in philosophy with such emphasis as best suits their needs. For such students the School endeavors to outline a plan of philosophical study (in courses or directed reading) which will form a natural supplement to their field of research.

ROMANCE STUDIES *(ARTS)*

Professors F. B. Agard, *M. G. Bishop,* J. Colligno n, R. A. Hall, Jr., B. L. Rideout.

APPROVED MAJOR AND MINOR SUBJECTS

French Linguistics 1, 2, 3, 4
French Literature 1, 2, 3, 4
Italian 1, 2, 4
Romance Linguistics 1, 2, 3, 4
Spanish Linguistics 1, 2, 3, 4
Spanish Literature 1, 2, 3, 4

A working knowledge of Latin is especially desirable for all candidates for advanced degrees in this field. All candidates for the degree of Doctor of Philosophy must satisfy the language requirement in French and German before beginning to earn the fourth residence unit. A graduate student in romance studies should have completed some formal course of study in the language and literature of the language which he intends to select as his major subject and should have adequate preparation for advanced work in his minor subjects.

RUSSIAN *(ARTS)*

Professors G. H. Fairbanks (Linguistics), *Vladimir Nabokov* (Literature).

APPROVED MAJOR AND MINOR SUBJECTS

Russian Literature 1, 2, 3, 4

Slavic Linguistics 1, 2, 3, 4,

Course offerings in Slavic linguistics include Old Bulgarian and Old Russian; they also include courses in descriptive, historical, and comparative methods of analysis applied to the Slavic languages. Candidates for advanced degrees with a major in Slavic linguistics should have a reading knowledge of both French and German; candidates for the Ph.D. with a major in Slavic linguistics are expected to develop proficiency in a second Slavic language.

SPEECH AND DRAMA *(ARTS)*

Professors H. D. Albright, C. C. Arnold, Harry Caplan, G. A. McCalmon, W. H. Stainton, C. K. Thomas, H. A. Wichelns.

APPROVED MAJOR AND MINOR SUBJECTS

Division of Rhetoric and Public Address:
Rhetoric and Public Address 1, 2, 3, 4
Principles of Public Address 3, 4
Classical and Medieval Rhetoric 3, 4

Division of Dramatic Production:
Drama and the Theatre 1
Dramatic Production 2, 3, 4
Playwriting 2, 3, 4

Division of Phonetics:
Speech and Phonetics 1, 2, 3, 4
General Linguistics 1, 2, 3, 4
See also General Linguistics *(Arts)*

The chief aim of graduate work in speech and drama is to develop competent investigators and teachers for colleges and universities. In many cases, the work will require more than the minimum periods of residence. Ordinarily, residence in this University during at least two academic years will be necessary for the doctorate.

A requirement for major candidates in speech and phonetics is training in a foreign language equivalent to three college entrance units, or in two foreign languages equivalent to two college entrance units in each.

Candidates for the Doctor's degree whose major interest is in rhetoric, that is, in the principles, history, and criticism of public address, will usually choose one minor subject from the field of literary history and criticism or from that of the social sciences.

Candidates for the Doctor's degree whose major interest is in drama and the theatre will be required to take dramatic literature as a minor subject, unless they have already pursued systematic study in dramatic literature, and such candidates must expect to be in residence two years and one summer beyond the requirements for the Master's degree. If preparing for general teaching, candidates will be advised to take additional courses in public speaking and speech training.

Candidates for the Master's degree in dramatic production will require at least one academic year and one summer session of residence.

Students in the Division of Dramatic Production will be expected to avail themselves of the opportunities for theatre practice afforded by various branches of The Cornell University Theatre.

SOCIAL SCIENCES

AGRICULTURAL ECONOMICS *(AG.)*

Professors C. A. Bratton, M. E. Brunk, K. S. Carpenter, H. E. Conklin, L. C. Cunningham, L. B. Darrah, L. H. Davis, Herrell DeGraff, B. A. Dominick, W. G. Earle, R. N. Hampton, V. B. Hart, *G. W. Hedlund,* T. N. Hurd, C. D. Kearl, M. S. Kendrick, C. W. Loomis, E. A. Lutz, J. W. Mellor, E. G. Misner, F. A. Pearson, M. P. Rasmussen, K. L. Robinson, R. S. Smith, Leland Spencer, B. F. Stanton, R. P. Story, S. W. Warren.

APPROVED MAJOR AND MINOR SUBJECTS

Economics of Agriculture 1, 2, 3, 4
Farm Management 1, 2, 3, 4
Prices and Statistics 1, 2, 3, 4
Marketing and Business Management 1, 2, 3, 4
Public Administration and Finance 1, 2, 3, 4

A broad knowledge of the physical and biological aspects of agriculture is valuable background for graduate work in the Field of Agricultural Economics. Undergraduate training should include the basic sciences as well as courses in the production, handling, and processing of farm products. (An undergraduate major in Agricultural Economics is not required for graduate work in this field.) Firsthand experience in farming is desirable in the attainment of proficiency in the field.

Candidates for the Doctor's degree in addition to selecting a major may also select a minor from the above list of approved major and minor subjects but should choose a second minor from among subjects offered elsewhere in the University.

The department offers opportunities for study and research in the following specialized branches: Farm Management, Farm Finance, Marketing, Prices, Statistics, Business Management, Public Administration and Finance, Agricultural Land Economics, Agricultural Geography, and Agricultural Policy. Students have the opportunity and are encouraged to take courses in related fields such as Economics, Statistics, and Mathematics.

The Department has excellent facilities for study and research. Offices are supplied for graduate students and laboratories equipped with modern calculating machines are available.

Assistantships are available that provide an opportunity for part-time employment in teaching, research, or extension. Assistants normally conduct their thesis research as part of their assistantship duties in connection with departmentally financed projects.

The Department does not require a foreign language for the degree of Master of Science.

BUSINESS AND PUBLIC ADMINISTRATION

Professors E. Brooks, H. G. Canoyer, E. Dale, M. G. de Chazeau, F. F. Gilmore, A. M. Hillhouse, R. S. Holmes, J. G. B. Hutchins, E. H. Litchfield, A. E. Nilsson, A. C. Rankin, J. M. Rathmell, W. H. Shannon, D. A. Thomas, J. D. Thompson, *P. P. Van Riper,* P. Wasserman, T. P. Wright.

APPROVED MAJOR AND MINOR SUBJECTS

The Administrative Process 1, 3, 4
Finance and Accounting 1, 3, 4
Supply, Production, and Distribution 1, 3, 4
Managerial Economics and Politics 1, 3, 4

The professional degrees of Master of Business Administration and Master of Public Administration are awarded by action of the Faculty of the Graduate School of Business and Public Administration under conditions imposed by that Faculty, and the prospective candidate should consult the *Announcement of the Graduate School of Business and Public Administration.*

The Ph.D. program in the Field of Business and Public Administration is aimed at providing an advanced and comprehensive education in administration, public and private, primarily for men who seek careers in teaching or research in this professional field. However, through this program a student may also prepare for many types of positions in business and governmental administration in which advanced training, if not always an absolute requirement, is highly desirable.

Candidates for the Ph.D. degree proposing to major in Business and Public Administration must select a major subject from among those listed above. One of the student's minor subjects may also be selected from this list. However, it is the policy of the Field of Business and Public Administration to encourage the student to select his second minor from among related subjects outside this Field. Ph.D. candidates with majors in Fields other than Business and Public Administration, but who wish to minor in this Field, may also choose from among the above four subjects. Minors at the Master's level are not encouraged except in unusual cases. Though the requirements for a minor are somewat less rigorous and advanced than for a major, minors at either the Master's or doctoral level presume a suitable foundation for advanced work.

Brief descriptions of the scope and method of the subjects in the field of Business and Public Administration are outlined below:

THE ADMINISTRATIVE PROCESS. This subject embraces all aspects of the art and science of administering organizations, involving such administrative matters as internal organization and structure, administrative behavior, coordination and control, communications, personnel and human relations, planning, policy formulation, and program development. It will normally require the study of both private and public administration, and, in some cases, of foreign administration as well.

FINANCE AND ACCOUNTING. This subject concerns those aspects of administration which are subject to monetary measurement and analysis. It includes accounting, with its body of doctrine and its professional literature, together with financial analysis of all types, ranging from those found in private investment activities to those involved in the operations of public treasurers and budget directors.

SUPPLY, PRODUCTION, AND DISTRIBUTION. This subject embraces another large and interrelated group of management functions found in both private and public administration. It includes work in marketing and market research, production and procurement, and, to some extent, traffic management.

MANAGERIAL ECONOMICS AND POLITICS. This subject emphasizes the selection and analysis of economic and political data and relationships as a guide to decision-making and policy formulation, and involves interdisciplinary work in economics, political science, and administration. The student may approach this subject either through the comprehensive and intensive study of economic, political, and administrative factors and interrelationships associated with particular industries or public agencies (interpreting "industry" and "agency" broadly), or, from an over-all point of view, through the study of various types of problems and relationships which may be recurrent through a number of industries and public agencies or through the administrative structure of a particular country or society. For example, students may approach this subject (1) through study of the transportation industry, of the problems in city management, etc., or (2) through study of some over-all problem such as competitive behavior, economic instability, etc.

Admission to the Ph.D. program in Business and Public Administration generally presumes academic work in administration or related social science fields at the

Master's level. Ordinarily the candidate is expected to have a Master's degree, but this is not an absolute requirement.

A number of fellowships and scholarships are made available each year for candidates for the Ph.D. degree in Business and Public Administration (see Fellowships and Scholarships, p. 26). Prospective students interested in teaching or research assistantships should make their inquiries direct to the Field Representative, Graduate School of Business and Public Administration, McGraw Hall.

CHILD DEVELOPMENT AND FAMILY RELATIONSHIPS *(H.E.)*

Professors A. L. Baldwin, M. L. Barrett, W. L. Brittain, U. Bronfenbrenner, R. H. Dalton, E. C. Devereux, Jr., H. Feldman, M. E. Ford, J. Harding, L. D. Rockwood, K. M. Reeves, F. I. Wilson.

APPROVED MAJOR AND MINOR SUBJECTS

Child Development and Family Relationships 1, 2, 3, 4

Child Development 3, 4

Family Relationships 3, 4

As a basis for graduate work some training in the social sciences or related disciplines is desirable. As a background for advanced work some experience in one of the following areas is also desirable: teaching or other experiences with children, adolescents, or adults; social or clinical work; or extension teaching or administration. However, admission to graduate work is based primarily on evidence of the student's competence to do advanced work and on broad preparation as a basis for specialization. Opportunities to acquire background in the social sciences are available, and the graduate student with relatively little preparation in the social sciences should plan on additional time for the completion of his degree.

Laboratory experience is provided in the Department nursery school, in public nursery schools, in play groups in settlement houses, and in other organized groups with school-age children. Insofar as facilities are available, graduate students are helped to find ways to put their knowledge into practice.

The department has currently two major research projects in which students may participate for the purposes of training and research. One project is a long-range interdisciplinary series of researches in social growth. The other project is concerned with child-rearing practices.

Several teaching and research assistantships are available. These are usually awarded to advanced graduate students. Application should be made directly to the Department of Child Development and Family Relationships.

Since the subject matter in child development and family relationships requires an interdisciplinary approach, students are encouraged to supplement their work in the department with study in related areas. For related courses, see the departments in the *Announcements* indicated: Departments of Psychology and Sociology and Anthropology *(Arts);* Departments of Rural Education and Rural Sociology *(Ag.);* School of Education *(Ed.);* and School of Industrial and Labor Relations *(I.L.R.).*

CITY AND REGIONAL PLANNING *(ARCH.)*

(See page 41.)

ECONOMICS *(ARTS)*

Professors G. P. Adams, Jr., M. A. Copeland, D. F. Dowd, F. H. Golay, J. G. B. Hutchins, A. E. Kahn, M. S. Kendrick, R. E. Montgomery, Chandler Morse, P. M. O'Leary, E. J. Rice.

APPROVED MAJOR AND MINOR SUBJECTS

Economic History 1, 2, 3, 4

Economic Theory and Its History 1, 2, 3, 4
Industrial Organization, Control and Finance 1, 2, 3, 4
International Economics 1, 2, 3, 4
Labor Economics 1, 2, 3, 4
Monetary Economics and Fiscal Policy 1, 2, 3, 4
Public Finance 1, 2, 3, 4
Economic Statistics 1, 2, 3, 4
Trade Fluctuations and Determination of Output and Income 1, 2, 3, 4

Language requirement for Master's degree: college entrance language.

1. For graduate work in economics a student should have the equivalent of an undergraduate major in general economics.

2. All candidates for the degree of Ph.D. with major in economics will be required to demonstrate competence in at least three subsidiary fields selected from the list of approved major and minor subjects in addition to their chosen major and minor subjects. One of these subjects must be economic theory and its history unless that is selected as a major or minor subject.

3. All candidates for advanced degrees who elect a minor in economics will be held for work in economic theory.

4. Candidates for advanced degrees with major in economics may elect one minor subject from another field, or may, with the approval of their Special Committees, substitute subjects outside economics for one or two of those listed above.

5. Applications for fellowships and scholarships in economics should be filed with the Dean of the Graduate School prior to February 17. Applications for teaching fellowships, however, should be made directly to the Chairman of the Department of Economics.

ECONOMICS OF THE HOUSEHOLD AND HOUSEHOLD MANAGEMENT *(H.E.)*

Professors M. M. Knoll, M. A. Rollins, K. Walker, E. C. Warren, J. Warren, L. J. Williamson.

APPROVED MAJOR AND MINOR SUBJECTS

Economics of the Household and Household Management 1, 2, 4
Economics of the Household 2, 3, 4 Household Management 2, 3, 4
Home Economics (General) 5

Students selecting a major in economics of the household and household management are expected to take courses in both phases of the field; for the degree of Ph.D. the minor subjects are usually selected to support one phase or the other. Appropriate minor subjects may be chosen from a variety of fields including other branches of home economics, as well as agricultural economics, economics, education, psychology, sociology.

As a background for graduate work in this field, a well-rounded undergraduate program in home economics is preferable, in general, to specialization. Undergraduate courses in mathematics, statistics, economics, history, anthropology, sociology, psychology, physics, chemistry, physiology, and bacteriology are also useful.

EDUCATION AND RURAL EDUCATION *(ED.)*

Professors J. S. Ahmann, H. G. Andrus, A. L. Baldwin, Sara Blackwell, J. M. Brophy, Pauline Neville Campbell, H. R. Cushman, R. H. Dalton, L. H. Elliott, Carol Engebretson, Jean Failing, R. B. Fischer, F. S. Freeman, M. D. Glock, Eva L. Gordon, C. W. Hill, L. B. Hixon, Helen Hoefer, Margaret Hutchins, P. G. Johnson, C. L. Kulp, J. P. Leagans, Helen Moser, A. T. Mosher,

A. G. NELSON, IRENE PATTERSON, ISABEL PEARD, KATHERINE REEVES, W. A. SMITH, F. H. STUTZ, F. K. T. TOM, HELEN WARDEBERG, *A. L. Winsor;* DEANS FRANK BALDWIN and DOROTHY V. N. BROOKS.

APPROVED MAJOR AND MINOR SUBJECTS

Agricultural Education 1, 2, 3, 4
Education 3, 4
Educational Administration and Supervision 1, 2, 3, 4
Educational Psychology and Measurement 1, 2, 3, 4
Elementary Education 1, 2, 3, 4
Extension and Adult Education 1, 2, 3, 4
Guidance and Personnel Administration 1, 2, 3, 4
History and Theory of Education 1, 2, 3, 4
Home Economics Education 1, 2, 3, 4
Industrial Education 1, 2, 3, 4
Nature, Science and Conservation Education 1, 2, 3, 4
Secondary Education and Curriculum 1, 2, 3, 4

Students in education may be admitted to candidacy for two types of advanced degrees: (1) the general degrees, M.A., M.S., or Ph.D., or (2) the professional degrees, M.Ed., or Ed.D. Requirements for (2) and a listing and description of courses in this field are to be found in the *Announcement of the School of Education.*

The requirements for admission to candidacy for the general degrees are the same as those for the professional degrees. In the field of Education there is no foreign language requirement for Masters' degrees unless stipulated by the candidate's Special Committee.

FAR EASTERN STUDIES *(ARTS)*

Professors Knight Biggerstaff, J. M. ECHOLS, F. H. GOLAY, C. F. HOCKETT, R. B. JONES, G. McT. KAHIN, M. E. OPLER, N. A. PATTILLO, H. E. SHADICK, LAURISTON SHARP, R. J. SMITH.

APPROVED MAJOR AND MINOR SUBJECTS

Chinese Literature 1, 2, 3, 4
Far Eastern Studies 3, 4

Requirements for the Doctor's degree with a major in Chinese literature: (1) familiarity with representative works in classical and vernacular Chinese; (2) broad knowledge of the available translations of Chinese literature and critical studies in Western languages; (3) specialized knowledge of at least two subfields such as the Confucian or Taoist classics, poetry, drama, fiction, classical prose, or twentieth-century writings.

The requirements for the M.A. degree or for a minor in Chinese literature are roughly equivalent to (1) and (2) above.

The requirements for the minor in Far Eastern Studies include a thorough factual knowledge of China or Southeast Asia or India and a general acquaintance with one other of these areas.

The department administers special interdisciplinary area programs on China, Southeast Asia, and India. These are fully described in the *Announcement of the Department of Far Eastern Studies,* obtainable from the department, Morrill Hall. Graduate students in the China program may major in Far Eastern history (see History) or in Chinese literature; or they may minor in these fields or in Far Eastern Studies, with the major in another field. Graduate students in the Southeast Asia or India programs may major in any field for which study of these areas is relevant; they minor in Far Eastern Studies.

Several assistantships are available for which application should be made directly to the Department of Far Eastern Studies. A number of special scholarships and fellowships are available to students in the China and Southeast Asia programs; see Fellowships and Scholarships, p. 26.

The Cornell University Library includes unique European-language collections on China, Southeast Asia, and India and good working collections of books and periodicals in Chinese, Indonesian, and Thai.

GENERAL LINGUISTICS *(ARTS)*

Professors F. B. Agard, *J M. Cowan,* J. M. Echols, G. H. Fairbanks, W. H. French, R. A. Hall, Jr., C. F. Hockett, W. G. Moulton, C. K. Thomas.

APPROVED MAJOR AND MINOR SUBJECTS

General Linguistics 1, 2, 3, 4

The following more specialized linguistic fields, listed elsewhere, are also available: Speech and Phonetics (see Speech and Drama); Latin language, Greek language (see the Classics); Old and Middle English (see English Language and Literature); Germanic linguistics (see German); French, Spanish, and Romance linguistics (see Romance Studies); and Slavic Linguistics (see Russian). In any of these, emphasis is laid on (1) methodology, and (2) the body of results already attained in the field; in general linguistics the primary emphasis is on (1), and in the linguistics of a specified language or group of languages the primary emphasis is on (2).

Other special research interests of the staff members, in which formal or informal course work can be arranged upon demand, are: Pidginized and Creolized Languages; Dialectology and Linguistic Geography, especially in the American-English, Dutch, French, German, and Italian areas; Comparative Indo-European; Classical and Modern Armenian; Pali and Old Persian; American Indian Languages; Language and Culture; Information Theory; Burmese, Chinese, Indonesian, Thai, and Vietnamese.

Candidates for the M.A. with a major in general linguistics are required to have a reading knowledge of either French or German. Candidates for the Ph.D. with a major in general linguistics are required to have a reading knowledge of both French and German and to elect cultural anthropology as one of their minors.

The Cornell Linguistics Club, open to all interested, meets biweekly throughout the school year and affords an opportunity for the presentation and discussion of current developments in linguistics.

GOVERNMENT *(ARTS)*

Professors H. W. Briggs, R. E. Cushman, A. T. Dotson, *Mario Einaudi,* A. Hacker, G. McT. Kahin, H. M. Roelofs, C. Rossiter.

APPROVED MAJOR AND MINOR SUBJECTS

American Government and Institutions 1, 2, 3, 4
Comparative Government 1, 2, 3, 4
Constitutional Law 1, 2, 3, 4
International Law and Organization 1, 2, 3, 4
International Relations 1, 2, 3, 4
Political Theory 1, 2, 3, 4
Public Administration 1, 2, 3, 4

For graduate work in government a candidate should have a general knowledge of political science, history, economics, and international affairs. It is recommended that candidates for the Ph.D. with major study in government should take at least one minor outside the field.

In addition to the qualifying and final examinations, candidates for the Ph.D. with a major in government will be required to pass a comprehensive written examination prior to the completion of four terms of residence and before commencing work on the thesis. This examination shall comprise American government and institutions, political theory, and three additional subjects to be selected by the candidate: either (1) from the approved major and minor subjects listed by the

Field, or (2) where minor subjects are taken outside the Field, from such minors as may be required by the professor in charge.

The attention of students desiring to do graduate work in public law is directed to opportunities open to them in the Law School. Members of the Faculty of the Law School may serve as members of Special Committees where appropriate arrangements have been made.

HISTORY *(ARTS)*

Professors KNIGHT BIGGERSTAFF, D. B. DAVIS, E. W. FOX, P. W. GATES, HENRY GUERLAC, M. L. W. LAISTNER, F. G. MARCHAM, *T. E. Mommsen,* C. P. NETTELS, DEXTER PERKINS, E. F. RICE, JR., W. M. SIMON, MARC SZEFTEL.

APPROVED MAJOR AND MINOR SUBJECTS

American History 1, 2, 3, 4
Ancient History 1, 2, 3, 4
Far Eastern History 1, 2, 3, 4
English History 1, 2, 3, 4
History of Science 1, 2, 3, 4
Medieval History 1, 2, 3, 4
Modern European History 1, 2, 3, 4
Slavic History, 1, 2, 3, 4

For graduate work in history a student should have a general knowledge of history, political science, economics, and other social studies. He should be able to read two foreign languages, ordinarily French and German. For major work in ancient history he needs a reading knowledge of both Greek and Latin; for major work in medieval history a reading knowledge of Latin; for major work in Far Eastern history a reading knowledge of the appropriate Far Eastern language; for major work in Slavic history a reading knowledge of Russian. Such linguistic training should preferably be obtained by the student during his undergraduate years, but deficiencies can be made up after admission to the Graduate School. Candidates taking major work in history may take minors in history or in other Fields, such as government, economics, sociology, philosophy, literature, or industrial and labor relations.

Several assistantships are available. Prospective students interested in applying for them should write directly to the Department of History, Boardman Hall.

HOME ECONOMICS, GENERAL *(H.E.)*

Professors: See Child Development and Family Relationships, Economics of the Household and Household Management, Food and Nutrition, Home Economics Education, Housing and Design, Institution Management, Textiles and Clothing. *M. Ryan.*

APPROVED MINOR SUBJECT

General Home Economics 5

For students who wish the minor to give breadth of contact with the field of home economics rather than depth in one area. Courses to be selected from the offerings in several of the areas of home economics.

HOME ECONOMICS EDUCATION *(H.E., ED.)*

Professors S. BLACKWELL, H. HOEFER, M. HUTCHINS, H. MOSER, *I. Patterson.*

APPROVED MAJOR AND MINOR SUBJECTS

Home Economics Education 1, 2, 3, 4

The types of advanced degrees for which graduate students majoring in home economics education may become candidates are: (1) Master of Science; (2) Master of Education; (3) Doctor of Philosophy; (4) Doctor of Education. For (2) and (4) see the *Announcement of the School of Education.*

A candidate for an advanced degree with a major or minor in home economics education is expected to have an undergraduate major in home economics and some courses in education. Experience in teaching children and adults is desirable as a basis for graduate work and may be accepted in some cases in lieu of undergraduate courses.

Graduate students may prepare for some specialized phase of home economics education, such as adult education, extension teaching, secondary school teaching, college teaching, administration and supervision of home economics programs, and research in home economics education. Students may observe and participate in home economics programs at all grade and age levels through the schools, the extension service, and other agencies. They may also participate in the research program of the Department. One of the current projects is focused on appraising high school homemaking programs, with special emphasis on the areas of child development and personal relationships. Another project deals with the undergraduate program in teacher education with attention to a community approach to student teaching.

All candidates for advanced degrees in home economics education are expected to acquire a general knowledge of the history and philosophies of education. In addition, doctoral candidates with a major in home economics education should also develop: (a) a thorough understanding of the principles of curriculum development, educational psychology, teaching methods, and evaluation, and their application to homemaking education; and (b) an understanding of research methods in education.

A doctoral candidate with a minor in home economics education or a Master's candidate with a major in home economics education should have, in addition to a general knowledge of history and philosophy of education, some understanding of the principles of curriculum development, educational psychology, teaching methods, and evaluation.

HOTEL ADMINISTRATION *(HOTEL)*

Professors R. A. Beck, P. R. Broten, C. E. Cladel, M. E. Ericson, M. P. Ham, *G. W. Lattin,* H. B. Meek, F. H. Randolph, H. J. Recknagel, C. I. Sayles, T. W. Silk, L. Toth, J. J. Wanderstock.

APPROVED MAJOR AND MINOR SUBJECTS

Hotel Administration 1, 2, 4 Hotel Accounting 2, 3, 4

Graduate work in the Field of Hotel Administration is open to those *who have completed in full the requirements for the undergraduate degree in the School of Hotel Administration and to them only.*

Students who hold Bachelors' degrees in the liberal arts or in general business administration who wish a program in hotel administration normally enroll in the undergraduate division. They may become candidates for an additional Bachelor's degree or at their choice simply enroll for a specialized program of hotel administration courses suited to their particular needs.

HOUSING AND DESIGN *(H.E.)*

Professors R. R. Arnold, G. H. Beyer, *H. J. Cady,* J. E. Montgomery, S. Neblett, C. Straight, V. True.

APPROVED MAJOR AND MINOR SUBJECTS

Housing and Design 1, 2, 3, 4

Language requirement for the Master's degree: college entrance language.

For the degree of M.S. with a major in housing and design the work may be focused in housing or in design. The student should have a general knowledge of basic concepts of the particular area (or branch of the area) in the field of housing and design in which he proposes to major.

The program for the degree of M.S. varies for each phase of study. Flexibility in programing cares for varying backgrounds and objectives of students. A major must obtain a comprehensive knowledge of one of the areas in this field. The student is required to fill in gaps in his background where they apply in such areas as social science, fine arts, statistics, and research methods. The candidate should choose a minor in a related area.

A major in the area of Housing and Design leading to the Ph.D. degree is possible. The emphasis would be on the socio-economic and family aspects of housing.

For work toward the doctorate with a major in housing and design the student must expand his knowledge beyond the specialized area in which he focused for work toward the Master's degree. Professional experience is desirable. Two minors are selected from fields related to housing and design.

Members of the staff will direct work in the following areas: *Design:* Professors Arnold, Cady, Neblett, Straight, True; *Economic Aspects of Housing and General Housing Research:* Professor Beyer; *Socio-psychological Aspects of Housing:* Professor Montgomery.

INDUSTRIAL AND LABOR RELATIONS *(I.L.R.)*

Professors L. P. Adams, R. L. Aronson, I. Blumen, J. M. Brophy, T. Burling, J. Carpenter, M. P. Catherwood, M. G. Clark, R. Corvini, D. E. Cullen, R. H. Ferguson, F. F. Foltman, *C. A. Hanson,* W. Hodges, V. H. Jensen, M. R. Konvitz, A. H. Leighton, D. M. McIntyre, P. J. McCarthy, J. W. McConnell, J. T. McKelvey, J. G. Miller, R. E. Montgomery, M. F. Neufeld, O. Ornati, R. Raimon, R. F. Risley, F. Slavick, A. W. Smith, N. A. Tolles, W. F. Whyte, B. F. Willcox, A. L. Winsor.

APPROVED MAJOR AND MINOR SUBJECTS

Collective Bargaining 1, 2, 3, 4
Economic and Social Statistics 1, 2, 3, 4
Human Relations in Industry 1, 2, 3, 4
Industrial and Labor Relations Problems 4
Industrial Education 1, 2, 3, 4
Labor Market Economics and Analysis 1, 2, 3, 4
Labor Union History and Administration 1, 2, 3, 4
Personnel Administration 1, 2, 3, 4
Social Security and Protective Labor Legislation 1, 2, 3, 4

Language requirement for Master's degree: proficiency in one language approved by the Special Committee before beginning the second residence unit.

A description of the program leading to the degree of Master of Industrial and Labor Relations, which is designed to provide broad coverage and some specialization, is found in the *Announcement of the School of Industrial and Labor Relations.*

For both the M.S. and Ph.D. degrees emphasis is placed upon independent study and research. The following are minimum requirements prerequisite to the independent investigations required in the major or minor subjects:

Collective Bargaining. For a major in this subject, the candidate must show (1) knowledge of the history of collective bargaining as well as knowledge of current developments and issues, including knowledge of structures, procedures, and practices generally, and also specific knowledge of collective bargaining and the content of agreements in different types of industry; (2) ability to analyze thoroughly the major issues and problems in collective bargaining in economic, social, and political terms; (3) knowledge of state and federal legislation and practice, historically and currently in the field of labor relations, mediation, and arbitration; (4) knowledge of leading cases in the field of labor law; (5) understanding of administrative agencies and their functions.

For a minor, (1), (3), (5) are required.

ECONOMICS AND SOCIAL STATISTICS. For a major in this subject the candidate must show (1) good command of the principles of statistical reasoning; (2) proficiency in the use of statistical methods and in the processing of statistical data; (3) qualified skill in the application of proper statistical tools of analysis to a specific topic in economics or social studies, including a thorough knowledge of statistical sources; (4) knowledge of differential and integral calculus.

For a minor, (1), (2), (3) are required, the level being less advanced than for a major.

HUMAN RELATIONS IN INDUSTRY. For a major in this subject, the candidate must present (1) acquaintance with the fields basic in human and social behavior including biology, the physiology of the nervous system, and the psychology of the individual; (2) comprehensive knowledge of relevant areas in social psychology and cultural anthropology, especially the fundamentals of individual and group behavior and the nature of institutions; (3) familiarity with the principal human relations problems commonly found in industrial and labor relations and the bearing of these problems on other fields such as collective bargaining, labor organization, management organization, economics, and law; (4) knowledge of the problems involved in the relationship between industries and communities; (5) thorough knowledge of pertinent research techniques and methods employed in human relations problems; (6) knowledge of resources generally available in educational techniques and in community services that have bearing on human relations problems.

For a minor, (1), (2), and (3) are required.

INDUSTRIAL AND LABOR RELATIONS PROBLEMS. (Offered as a minor only to graduate students in fields of study other than industrial and labor relations.)

A candidate for an advanced degree must have a general understanding of the subject matter in the field of industrial and labor relations. In order to prepare for a minor in this Field, the candidate will normally complete three to five courses in accordance with a program approved by his Special Committee.

INDUSTRIAL EDUCATION. For a major in this subject, the candidate must show (1) comprehensive understanding of industrial and technical education programs in public institutions, private institutions, and industry; (2) ability to develop analyses for instructional purposes and prepare an educational or training program based upon analyses; (3) understanding of economic, social, and scientific factors which may modify industrial and technical education programs; (4) understanding of instructional methods and their application in learning situations; (5) ability to apply administrative and supervisory principles to industrial and technical education programs; (6) detailed knowledge of bibliographies and sources of information in this field.

For a minor, (1), (2), and (4) are required.

LABOR MARKET ECONOMICS AND ANALYSIS. For a major in this subject, the candidate must show (1) comprehensive knowledge of the factors governing labor supply and demand; (2) thorough understanding of basic economic processes, especially in relation to employment, national income, production, wages, prices, and profits; (3) qualified skill in analyzing some specific labor market relationship such as manpower, labor mobility, wage determination, wage differentials, changes in wage structures, productivity, labor costs, or consumer incomes and expenditures; (4) competence in the use and application of quantitative methods; (5) knowledge of the history and the literature related to the subject.

For a minor, (1), (2), and (4) are required. When this subject is elected as a major, labor economics may not be elected as a minor.

LABOR UNION HISTORY AND ADMINISTRATION. For a major in this subject, the candidate must present (1) a working knowledge of the history of the American labor movement; (2) a working knowledge of the government and administration of the

American labor movement; (3) specific and detailed knowledge of the history, government, and administration of international and national labor unions in the United States; (4) familiarity with types of union leadership and rank-and-file behavior; (5) familiarity with the history, government, and administration of labor movements in other countries; (6) detailed knowledge of the bibliography and sources of information in this field.

For a minor in this subject, (1), (2), and (6) are required.

PERSONNEL ADMINISTRATION. For a major in this subject, the candidate must present (1) comprehensive knowledge of the general principles of administration, including personnel organization and operation; (2) ability to appraise critically personnel methods and procedures; (3) knowledge of labor and industrial legislation and functions of government as they relate to the personnel function; (4) knowledge of business and labor organizations and their impact on personnel relations; (5) insight concerning the basic attitudes modifying the relationships between individuals, groups, and organizations; (6) detailed knowledge of the bibliography and sources of information in this field.

For a minor, (1), (2), (3), and (6) are required.

SOCIAL SECURITY AND PROTECTIVE LABOR LEGISLATION. For a major in this subject, the candidate must show (1) familiarity with the sources and nature of insecurity; (2) a comprehensive knowledge of the origin, development, constitutionality, and administration of legislation in such fields as social insurance, minimum wages and hours, protection of women and children, discrimination, health and safety, workmen's compensation, public assistance, and labor relations; (3) a knowledge of the efforts of labor, industry, and the community to meet these problems on a voluntary basis; (4) familiarity with one special field of legislation and the administrative and legal experience in that field; (5) knowledge of the past and current proposals for improving and extending legislation.

For a minor, (1), (2), and (5) are required.

Interviews are desired with all applicants. If at all possible, persons interested in admission should arrange for a visit to Ithaca. Inquiries concerning interviews should be directed to the Director, Office of Resident Instruction, New York State School of Industrial and Labor Relations.

Applications for graduate assistantships to begin in September should be received not later than March and, for February, not later than December 1. Write to the Director, Office of Resident Instruction, for application material.

The Carnegie Corporation of New York has granted funds for two-year fellowships in industrial psychiatry, which provide an opportunity for trained psychiatrists to study at the New York State School of Industrial and Labor Relations and to apply psychiatric knowledge and methods to the problems of industry in actual plant situations. Applicants must hold an M.D. degree and have completed a minimum of two years of approved training in psychiatry.

Note, also, the special Tuition Scholarships, p. 27.

INSTITUTION MANAGEMENT *(H.E.)*

Professors Mary Bloetjes, ALICE BURGOIN, KATHLEEN CUTLAR, KARLA LONGREE, AIMEE MOORE.

APPROVED MAJOR AND MINOR SUBJECTS

Institution Management 2, 4

A strong background of undergraduate courses in food and nutrition and the supporting physical and biological sciences and a well-balanced program in other areas of home economics are expected. Undergraduate courses in institution management and some experience in the field of managerial dietetics or commercial food service administration are desirable.

Graduate work leading to the Master's degree may emphasize either the administrative or the more technical aspects of institution management. There is no prescribed program of study for either the major or the minor in this field. It is expected that the program will supplement the student's previous training and experience to achieve a well-rounded knowledge of the subject, with due consideration given to the student's purpose in undertaking graduate study.

Related minors are in other branches of home economics, particularly food and/or nutrition, or in such subjects as personnel administration, agricultural marketing, hotel accounting, and education.

Members of the staff will direct work in the areas of Institution Administration and Management and in experimental quantity cookery.

The department offers opportunities for experimentation in the research kitchen, the cafeteria, and the tea room. Several graduate assistantships are available.

LAW

Professors M. H. Cardozo, W. D. Curtiss, W. T. Dean, W. H. Farnham, H. A. Freeman, R. I. Fricke, H. G. Henn, J. W. MacDonald, L. W. Morse, R. S. Pasley, R. B. Schlesinger, G. J. Thompson, P. Ward, E. N. Warren, H. E. Whiteside, *B. F. Willcox.*

APPROVED MINOR SUBJECT

Law 4

RURAL SOCIOLOGY

Professors W. A. Anderson, G. J. Cummings, B. L. Ellenbogan, O. F. Larson, R. A. Polson, *C. E. Ramsey,* W. W. Reeder, P. Taietz, H. E. Thomas, R. M. Williams, Jr.

APPROVED MAJOR AND MINOR SUBJECTS

Rural Sociology 1, 2, 4
Organization Methods and Community Development 2, 3, 4
Methods in Social Research 2, 3, 4

A student offering *Rural Sociology* as a *major for the Ph.D. degree* is expected to acquire a thorough knowledge of (a) sociological theory and its history; (b) the methodology of sociological research; (c) rural sociology and the research in this field; and (d) organization methods and community development.

When *Rural Sociology* is offered as a *major for the M.S. degree* or as a *minor for the Ph.D. degree,* the candidate is expected to acquire a general knowledge of (a), (b), (c), and (d) listed above.

When *Organization Methods and Community Development* is offered as a *major for the M.S. degree* or as a *minor for the Ph.D. degree,* the candidate is expected to acquire a thorough knowledge of organization methods and community development and a general knowledge of (a), (b), and (c) listed above.

When *Methods in Social Research* is offered as a *major for the M.S. degree* or as a *minor for the Ph.D. degree,* the candidate is expected to acquire a thorough knowledge of the methodology of sociological research and a general knowledge of (a), (c), and (d) listed above.

Majors for the Ph.D degree are required to take one minor outside the field of Rural Sociology and in most cases will be encouraged to take both minors outside the major Field.

In general, for an M.S. major in the Field of Rural Sociology, the minor should be selected outside of the Field.

While any minor is possible, such minors as general sociology, social psychology, anthropology, family relationships, guidance and personnel administration, exten-

sion education, agricultural economics, statistics, and mathematics are among those most closely related and most frequently chosen.

The various college Announcements, which describe courses, should be consulted. Of interest to Rural Sociology majors and minors will be the offerings of the Departments of Sociology and Anthropology and of Psychology in the College of Arts and Sciences; of the Departments of Rural Education and Agricultural Economics in the College of Agriculture; of the Department of Child Development and Family Relationships in the College of Home Economics; and of the School of Industrial and Labor Relations.

Some of the occupational fields which graduates in Rural Sociology most frequently enter are college teaching and research in rural sociology; extension work in rural sociology; community development and extension work in foreign cultures and in underdeveloped areas; social research work with government and private organizations; and consultation in organization methods and community development. Many foreign students find this training fits their needs as they prepare for similar activities in their own countries.

Several teaching and research assistantships are available.

Research assistants and some other graduate students have the opportunity to participate in planning and carrying out the Department's research programs under the supervision of project leaders. Some of the projects currently active are: social change in rural areas; the rural-urban fringe; migratory farm labor problems; program planning procedures; old age and retirement; population trends; experiments in community development; evaluation methods; the sociology of health; social participation; and leadership development and leadership training.

Supervised field experience in organization methods and community development is also being instituted for mature, interested students. Those interested in some of the applications of research have an opportunity to observe and participate in the Department of Rural Sociology projects in extension work and in studies designed to test extension methods.

SOCIOLOGY AND ANTHROPOLOGY *(ARTS)*

Professors J. P. Dean, A. R. Holmberg, N. Kaplan, W. W. Lambert, A. H. Leighton, J. W. McConnell, M. E. Opler, M. Rosenberg, L. Sharp, R. J. Smith, *G. F. Streib,* E. A. Suchman, W. F. Whyte, R. M. Williams, Jr.

APPROVED MAJOR AND MINOR SUBJECTS

Sociology 1, 2, 3, 4	Cultural Anthropology 1, 2, 3, 4
Social Psychology 1, 2, 3, 4	Statistics 2, 3, 4

Language requirement for the Master's degree: proficiency in one language acceptable to the Special Committee.

For graduate work in any of these fields a student should have a general background in human biology, the social sciences, and the humanities. He should also have some knowledge of the basic concepts and applications of social statistics, although deficiencies in this respect can be made up in the course of his work as a graduate student.

It is recommended that candidates for advanced degrees in Sociology or Anthropology should take at least one minor outside these Fields.

There are several assistantships which are normally awarded to advanced graduate students. Applications should be made directly to the Department of Sociology and Anthropology.

The department sponsors various social research programs and field projects in which graduate students may participate directly for purposes of training or research. One such large-scale current research program involving a series of community studies of intergroup relations in various parts of the United States, including a

continuing study of a near-by industrial city, offers the graduate student a field laboratory for many kinds of community research. Another is a combined program of instruction and research on the modernization of nonindustrialized areas. In connection with this applied anthropology program, continuing field research projects have been initiated in the American Southwest, South America, India, and Southeast Asia to study the effects of the introduction of modern technology in underdeveloped regions. These and other research programs are carried on under the auspices of the Cornell Social Science Research Center, which is described in the section on Research Centers. One of the functions of the Center is to train graduate students in research methods by permitting them to work on established, active research projects.

The requirements for the Doctor's degree are listed below. The requirements for the M.A. or M.S. degrees correspond generally to the minor requirements for the Doctor's degree.

SOCIOLOGY. When offered as a major: (1) a thorough knowledge of the field of sociological theory and its history; (2) a thorough knowledge of the methodology of sociological research; and (3) a detailed knowledge of at least three subfields in sociology from among the following: American society, the family, formal organization and bureaucracy, intergroup relations, political sociology, public opinion or communication*, small groups*, social movements, stratification, urban sociology, and such related fields as cultural anthropology and social psychology.

When offered as a minor: a general knowledge of part (1) of the above requirement and a satisfactory knowledge of one or two subfields.

CULTURAL ANTHROPOLOGY. When offered as a major: (1) a thorough knowledge of the history of anthropology and of anthropological theory and method; (2) familiarity with the major culture areas of the world; (3) a detailed knowledge of the ethnology of at least one such area; (4) a grasp of the principles of linguistics and of physical anthropology, and familiarity with the most important findings of archaeology.

When offered as a minor: parts (1) and (2) of the above requirements.

STATISTICS. When offered as a minor for the Ph.D. degree: (1) completion of an approved sequence of courses; (2) completion of a research project which demonstrates that the candidate is able to select methods appropriate to the problems and to employ advanced statistical methods.

The prospective student is advised to consult the *Announcements* describing offerings of the following Departments for information about other instruction and research in the field of Sociology and Anthropology: Psychology *(Arts)*, the Department of Rural Sociology *(Ag.)*, the School of Industrial and Labor Relations *(I.L.R.)*, the Department of Child Development and Family Relationships *(H.E.)*, and Far Eastern Studies *(Arts)*.

STATISTICS *(AG., ARTS, ENGIN., I.L.R.)*

Professors I. BLUMEN, R. BECHHOFER, W. T. FEDERER, *P. J. McCarthy*, R. G. D. STEEL.

APPROVED MAJOR SUBJECT

Statistics 1, 2

Language requirement for Master's degree: proficiency in French, German, or Russian or an approved substitute before completion of the second residence unit.

The aim of graduate work in statistics is the training of individuals who will (1) have a thorough knowledge of the theoretical basis of modern statistical method and have demonstrated ability to make significant contributions to this theory, (2)

*Permitted only for students not offering Social Psychology as a minor.

have developed an understanding of the methods of scientific research in general and the role which statistics plays in this research, and (3) have had experience in aiding workers in various fields in the application of statistical method. For this reason, the minor subject or subjects must be taken with individuals outside the Field, and one minor will ordinarily be in the Field of Mathematics. Students preparing for graduate work in statistics are urged to obtain a thorough grounding in mathematics through advanced calculus since their program of study will be seriously delayed if this preparation is lacking. If their interest is primarily in mathematical statistics they should consult the announcement of the Field of Mathematics.

A student majoring in statistics must complete a graduate sequence of courses in mathematical statistics (offered in the Department of Mathematics) which has been approved by his committee. Other course work required of majors in statistics will be chosen from among offerings by the above listed members of the Field in the Departments of Plant Breeding *(Ag.)* and Sociology *(Arts)*, and the Schools of Mechanical Engineering *(Engin.)* and Industrial and Labor Relations *(I.L.R.)*. Provisions for minoring in statistics are given in the announcements of the Fields of Economics, Industrial and Labor Relations, Mathematics, Mechanical Engineering, Plant Breeding, and Sociology. A brochure on statistics may be obtained by writing to the Cornell Statistics Center, Warren Hall.

TEXTILES AND CLOTHING *(H.E.)*

Professors F. Y. Boak, G. L. Butt, M. Humphrey, E. F. McMurry, M. S. Ryan, O. K. Singleton, H. P. Smith, F. M. Spratt, *E. E. Stout,* M. V. White.

APPROVED MAJOR AND MINOR SUBJECTS

Textiles 2, 3, 4 Clothing 2, 3, 4

For students who wish to major or minor in the field of Textiles and Clothing, a wide variety of offerings is available both as to course work and opportunities for independent study. No set program of study is prescribed for majors and minors in this field. It is expected that the program will supplement the student's previous training. Broad home economics training as well as training in textiles and clothing is desirable. Deficiency in background courses is not necessarily a bar to admission, but it may increase the time needed to earn the degree.

Candidates for a Master's degree in the field of Textiles and Clothing are expected to acquire a general knowledge of all phases of the field and an understanding of research methods in textiles and clothing, and to concentrate in any one of the various areas of textiles and clothing.

Such facilities as a conditioning room, textile equipment, and a large collection of historical costumes are available for research. For further information concerning facilities, write to the Field Representative.

Ongoing research in the areas of textiles and psychology of clothing allow for student participation.

Students working toward a Doctor of Philosophy degree in allied fields may minor in textiles and clothing.

A limited number of assistantships are available in the department.

BIOLOGICAL SCIENCES*

AGRICULTURAL ENGINEERING *(AG.)*

Professors L. L. Boyd, E. W. Foss, *O. C. French,* H. E. Gray, W. W. Gunkel, B. A. Jennings, L. W. Larson, G. Levine, W. F. Millier, E. S. Shepardson, J. W. Spencer, C. W. Terry, C. N. Turner, F. B. Wright.

APPROVED MAJOR AND MINOR SUBJECTS

Note: If the major for the M.S. degree is in the subject of Agricultural Engineering, the minor should not be elected from the other four subjects; if the major for the Ph.D. degree is in the subject of Agricultural Engineering not more than one of the other four subjects may be elected for a minor.

Agricultural Engineering 1, 2, 3, 4
Farm Electrification 1, 3, 4
Farm Structures 1, 3, 4
Power and Machinery 1, 3, 4
Soil and Water Engineering 1, 3, 4

See also Civil Engineering, p. 78 and Mechanical Engineering, p. 83

To be admitted as a candidate for an advanced degree in this field an applicant will be required to have completed the equivalent of a recognized agricultural engineering curriculum with a scholarship ranking in at least the upper half of his class. A knowledge of general agriculture is also essential. This requirement may be satisfied by adequate general farm work experience or formal courses such as botany, soils, field crops, animal husbandry, and farm management.

An applicant who is not able to meet the requirements for candidacy for an advanced degree may arrange for a program of work as a noncandidate.

AGRONOMY *(AG.)*

Professors S. R. Aldrich, M. Alexander, K. C. Beeson, R. Bradfield, N. C. Brady, C. S. Brandt, M. G. Cline, J. E. Dawson, S. N. Fertig, W. L. Griffeth, H. B. Hartwig, G. Johnsgard, *W. K. Kennedy,* D. J. Lathwell, H. A. MacDonald, R. D. Miller, R. B. Musgrave, M. G. Peech, M. M. Schreiber, E. L. Stone, P. J. Zwerman.

APPROVED MAJOR AND MINOR SUBJECTS

Soils 1, 2, 3, 4
Field Crop Production 1, 2, 3, 4

(a) *Special Interests of the Faculty*

Soils:

1. Soil chemistry: Professors Peech, Dawson, Beeson, and Brandt
2. Soil physics: Professor Miller
3. Soil microbiology: Professor Alexander
4. Soil fertility: Professors Bradfield, Brady, Alexander, and Lathwell
5. Soil morphology, genesis and cartography: Professors Cline and Johnsgard
6. Soil conservation: Professor Zwerman
7. Forest soils: Professor Stone
8. Organic soils: Professor Dawson

*Under Faculty listings for several of the biological Fields of Instruction some professors are listed *at Geneva.* This refers to the opportunities for research that are at the New York State Agricultural Experiment Station at Geneva (see page 37).

FIELD CROP PRODUCTION:

1. Forage crop production, management, and utilization: Professors Hartwig, MacDonald, Kennedy, and Griffeth
2. Cereal crops and crop ecology: Professors Musgrave and Aldrich
3. Weed control: Professors Fertig and Schreiber

Prospective students are urged to correspond with the professor in the above lists whose interests are nearest their own a few months in advance of the time they expect to enter.

(b) *Policies Peculiar to the Field*

Students preparing for graduate work in agronomy are urged to obtain a thorough knowledge of general physics, mathematics through calculus, analytical, organic, and physical chemistry, general botany, bacteriology, genetics, plant physiology, and geology. Opportunity will be afforded for further study of some of these subjects after entering the Graduate School, but a student deficient in two or more of these foundation courses cannot expect to receive a degree in the minimum time required for residence. Some practical farm experience with soil and crop management problems is also desirable. Opportunity to acquire additional experience will be afforded a limited number of students majoring in the field by summer employment on departmental projects.

Students must consult the professor in charge before registering for any course numbered above 100 (see Ag., Agronomy).

ANIMAL BREEDING AND PHYSIOLOGY *(AG.)*

Professors S. A. ASDELL, R. W. BRATTON, J. H. BRUCKNER, R. K. COLE, R. H. FOOTE, W. HANSEL, C. R. HENDERSON, F. B. HUTT, *S. C. King,* A. VAN TIENHOVEN.

APPROVED MAJOR AND MINOR SUBJECTS

Animal Breeding 1, 2, 4 Animal Genetics 1, 2, 4

Language requirement for the Master's degree: proficiency in French or German is required by Professors Cole and Hutt. The other professors in this Field usually require one language for the Master's degree if the student expects to become a candidate for the Ph.D.

Before entering graduate study in animal breeding, the student should have had courses in zoology, general biology, comparative anatomy, physiology, and chemistry, and elementary courses in genetics and animal breeding. Some practical experience in animal husbandry, poultry husbandry, or plant breeding is desirable.

In the course of their graduate study, students will be expected to take certain courses in animal physiology, biochemistry, embryology, cytology, genetics, biometry, and histology. One or more of these may be selected as a minor subject.

Graduate studies in animal breeding may be taken in several departments of the University, and the student should consult the course offerings of each of these departments.

Work in genetics and breeding of large animals, including physiology of reproduction, is offered in the Department of Animal Husbandry under the supervision of Professors Asdell, Bratton, Foote, Hansel, and Henderson.

Graduate study in animal genetics is offered in the Department of Poultry Husbandry, where work in that field is supervised by Professors Hutt, Cole, Bruckner, King, and Van Tienhoven.

ANIMAL HUSBANDRY *(AG.)*

Professors S. A. ADSELL, H. J. BEARDEN, R. W. BRATTON, H. W. CARTER, C. M. CHANCE, R. H. FOOTE, W. HANSEL, C. R. HENDERSON, G. R. JOHNSON, J. K. LOOSLI, C. M. MCCAY, J. I. MILLER, H. D. NAUMANN, J. T. REID, L. H. SCHULTZ, B. E. SHEFFY, S. T. SLACK, S. E. SMITH, G. W. TRIMBERGER, *K. L. Turk,* R. G. WARNER, G. H. WELLINGTON, J. P. WILLMAN.

APPROVED MAJOR AND MINOR SUBJECTS

Animal Husbandry 1, 2, 3, 4
Animal Nutrition 1, 2, 3, 4
Animal Breeding 1, 2, 3, 4
Dairy Husbandry 1, 2, 3, 4

Note: If the major for the Ph.D. lies in one of these fields, not more than one of the other three should be selected for a minor.

Although there are no foreign language requirements for the Master's degree, foreign language is recommended for those candidates who expect to go on for the Ph.D.

To enter graduate study in any of the subject matter fields in animal husbandry, the student should have the equivalent of the following courses: elementary feeds and feeding, animal breeding, and the various production courses in dairy and beef cattle, sheep, and swine. Also, the student should have basic courses in biology or zoology, bacteriology, chemistry, organic chemistry, mathematics, physics, animal physiology, and genetics.

In addition to the graduate courses in animal husbandry, candidates for the degrees of M.S. and Ph.D. will be expected to take advanced courses in chemistry, biochemistry, physiology, genetics, biological statistics, and other related fields.

ANIMAL NUTRITION *(AG.)*

Professors L. L. Barnes, G. F. Heuser, F. W. Hill, *J. K. Loosli,* C. M. McCay, L. C. Norris, J. T. Reid, M. L. Scott, B. E. Sheffy, S. E. Smith, R. G. Warner.

APPROVED MAJOR AND MINOR SUBJECTS

Animal Nutrition, 1, 2, 4

To enter upon graduate study with animal nutrition as a major subject, the student should have preparation in general biology or zoology, introductory chemistry, analytical chemistry, organic chemistry, physics, human or animal physiology, and animal breeding or genetics. Some preparation or experience in livestock or poultry production is desirable but not required.

In the course of preparation for an advanced degree, candidates are expected to acquire training in biochemistry, physiology, histology, and statistics. Students are generally advised to select either biochemistry or physiology as minor fields of study for the Master's degree and both of these subjects as minor fields for the doctorate. However, other minor fields of study such as animal breeding, pathology, or organic chemistry may be selected, depending upon the student's interest. Physical chemistry and advanced work in organic chemistry may be required of students particularly interested in the biochemistry of nutrition.

A strong research program in animal nutrition is maintained in the Cornell University Agricultural Experiment Station under the direction of members of the Faculty responsible for the training of graduate students in this field. Students are frequently able to broaden their research training and experience by participating in some of the animal nutrition projects of the Experiment Station. As a research problem for the degree, students are permitted to select, if they desire, various phases of established projects which permit them to exercise originality and independence of thinking.

Students expecting to continue their graduate studies should prepare to meet the language requirement for the doctorate during the course of their preparation for the Master's degree.

BACTERIOLOGY *(AG.)*

Professors E. A. Delwiche, G. Knaysi, H. B. Naylor, H. W. Seeley, Jr., J. M. Sherman, P. J. Vandemark, *M. R. Zelle.* At Geneva, *Professors* A. W. Hofer, G. J. Hucker, N. L. Lawrence, C. S. Pederson, K. H. Steinkraus.

APPROVED MAJOR AND MINOR SUBJECTS

Bacteriology 1, 2, 4 (See also Pathogenic Bacteriology 1, 2, 3, 4, p. 73)

Language requirement for Master's degree: college entrance language.

Students planning graduate study in bacteriology should have preparation in general chemistry, qualitative and quantitative analysis, and organic chemistry, and introductory courses in the biological sciences. In addition, training in physical chemistry and calculus is desirable. Deficiency in any of the subjects listed does not necessarily preclude admission but may increase the time necessary to earn a degree.

Well-equipped laboratories are available. Those fields of microbiological research in which the staff is experienced and especially interested include morphology and cytology, physiology and biochemistry, genetics, bacteriophagy, and systematic and applied bacteriology.

It is to be emphasized that in addition to a creditable performance in the formal program of courses leading to a broad knowledge of bacteriology and related fields, the graduate student for an advanced degree is expected to demonstrate ability to plan and conduct independent and original research. The successful culmination of a worthy research project is considered the important prerequisite to the Ph.D. degree.

BIOCHEMISTRY *(AG.)*

Professors W. L. Clark, L. J. Daniel, A. L. Neal, W. L. Nelson, *H. H. Williams.* At Geneva: *Professors* A. W. Avens, F. P. Boyle, D. B. Hand, R. W. Holley, Z. I. Kertesz, F. A. Lee, G. L. Mack, W. B. Robinson, E. Sondheimer, A. C. Wagenknecht.

APPROVED MAJOR AND MINOR SUBJECTS

Biochemistry 1, 2, 4

A student desiring to undertake graduate work in biochemistry should possess a sound chemistry background and a broad training in the biological and physical sciences. Opportunity will be provided by the extension of the period of graduate study for the candidate to correct minor deficiencies in the above areas. It is recommended that those entering with a strong background in chemistry should choose a biological subject as a minor, and conversely, those with a strong background in biology should choose a branch of chemistry as a minor. The program of study, including the selection of minor subjects, will be governed by the student's background, needs, and interests. By proper selection of minor subjects the student may focus his graduate study on animal or plant biochemistry but is expected to be proficient in the general field.

Candidates who choose biochemistry as a minor should have adequate training in chemistry and the biological sciences.

The laboratories at Ithaca are especially equipped for research in enzyme chemistry, intermediary metabolism, nutritional biochemistry, analytical methods, plant and animal investigations, and food biochemistry (at Ithaca and Geneva).

Several assistantships are available both at Ithaca and at Geneva each year, and applications for these should be made directly to the Faculty representative.

BOTANY *(AG.)*

Professors H. P. Banks, D. W. Bierhorst, W. D. Bonner, Jr., D. G. Clark, R. T. Clausen, J. M. Kingsbury, *L. F. Randolph,* F. C. Steward, J. F. Thompson, C. H. Uhl, and C. S. Yocum. At Geneva, *Professors* F. P. Boyle, B. E. Clark, W. F. Crosier, John Einset. At the Bailey Hortorium, *Professors* W. J. Dress, G. H. M. Lawrence, H. E. Moore, Jr.

APPROVED MAJOR AND MINOR SUBJECTS

General Botany 2, 4
Cytology 1, 2, 3, 4
Economic Botany 1, 2, 3, 4
Paleobotany 1, 2, 3, 4
Phycology 1, 2, 3, 4
Plant Morphology and Anatomy 1, 2, 3, 4
Plant Physiology 1, 2, 3, 4
Plant Taxonomy and Ecology 1, 2, 3, 4

Language requirement for Master's degree: college entrance French and/or German or proficiency before completion of second residence unit.

General Requirements for All Degrees

An adequate training in plant morphology and anatomy, plant physiology, and plant taxonomy is required of all candidates with major subjects in the field of botany.

Requirements for Major Subjects

Additional basic requirements for the major subjects are as follows:

GENERAL BOTANY. Additional requirements will be determined in each individual case.

CYTOLOGY AND CYTOGENETICS. An adequate knowledge of cytology and two of the following: an adequate knowledge of genetics or plant breeding, additional training in plant morphology and anatomy, plant physiology, or plant taxonomy. Professors Randolph and Uhl.

ECONOMIC BOTANY. Additional training in plant physiology and plant taxonomy, and adequate knowledge of one of the following: bacteriology, genetics, mycology, or plant breeding. Professor ———.

PALEOBOTANY. Additional training in plant morphology and anatomy, and adequate knowledge of paleobotany and general stratigraphic geology. Professor Banks.

PHYCOLOGY. An adequate knowledge of morphology and taxonomy. Additional training in cryptogamic botany and physiology. Professor Kingsbury.

PLANT MORPHOLOGY AND ANATOMY. Additional training in plant morphology and anatomy and plant taxonomy and adequate knowledge of cytology, genetics, or paleobotany. Professors Bierhorst and Banks.

PLANT PHYSIOLOGY. Additional training in plant physiology, and adequate knowledge of chemistry, a general knowledge of mathematics and physics, and training in bacteriology, genetics, mycology, plant pathology, or soils. Professors Bonner, Clark, Steward, Thompson, and Yocum.

PLANT TAXONOMY AND ECOLOGY. Additional training in plant taxonomy and ecology and an adequate knowledge of morphology, genetics and cytology. Professor Clausen.

Opportunity for graduate research in plant taxonomy, with similar requirements, is also available to a limited number of graduate students at the Bailey Hortorium. Research programs at the Hortorium deal primarily with cultivated plants but are necessarily based on studies of indigenous plant populations. Professors Lawrence, Moore, and Dress.

CONSERVATION *(AG.)*

Professors J. C. AYERS, C. O. BERG, W. R. EADIE, L. S. HAMILTON, W. J. HAMILTON, JR., O. H. HEWITT, P. P. KELLOGG, R. R. MORROW, A. M. PHILLIPS, JR., E. C. RANEY, C. G. SIBLEY, *G. A. Swanson,* D. A. WEBSTER, and *Research Associate* A. W. EIPPER.

APPROVED MAJOR AND MINOR SUBJECTS

Fishery Biology 1, 2, 3, 4
Forest Conservation 3, 4
Oceanography 1, 2, 3, 4
Vertebrate Zoology 1, 2, 3, 4 (including herpetology, ichthyology, mammalogy, and ornithology)
Wildlife Management 1, 2, 3, 4

Language requirement for the Master's degree: college entrance French and/or German or an approved substitute.

To undertake graduate study the student should be well prepared in general and vertebrate zoology and should have or must acquire a foundation in the specialized field of study which he intends to pursue. A strong background in the other natural and physical sciences is highly desirable, and a working knowledge of statistical methods is important in all fields. Staff members are available to direct graduate study during the regular University Summer Session, and selected summer courses are offered.

Members of the staff will be interested in directing research in the fields as listed: J. C. Ayers—oceanography and marine ecology; C. O. Berg—limnology; W. R. Eadie—mammalogy; L. S. Hamilton—forest conservation; W. J. Hamilton—mammalogy and herpetology; O. H. Hewitt—wildlife management; P. P. Kellogg—ornithology and biological acoustics; R. R. Morrow—forest conservation; A. M. Phillips—nutrition and physiology of fishes; E. C. Raney—ichthyology and management of coastal fisheries; C. G. Sibley—ornithology; G. A. Swanson—wildlife management; D. A. Webster—freshwater fisheries management.

Attention is also directed to the fields of study and courses offered in the Departments of Botany *(Ag.)*, Zoology *(Arts)*, and Entomology and Limnology *(Ag.)*. Graduate study in conservation education is directed under Nature, Science, and Conservation Education *(Ed.)*.

Preregistration is required for all courses in conservation.

DAIRY SCIENCE *(AG.)*

Professors J. M. Sherman, A. C. Dahlberg, *B. L. Herrington,* R. F. Holland, W. K. Jordan, F. V. Kosikowski, V. N. Krukovsky, R. P. March, H. B. Naylor, W. F. Shipe, Jr., J. C. White.

APPROVED MAJOR AND MINOR SUBJECTS

Dairy Science 1, 2, 4 Dairy Chemistry 1, 2, 4

The research interests of the individual members of the staff are broad, but, in general, they may be indicated as follows: J. M. Sherman, bacteriology; A. C. Dahlberg, technology of milk products; B. L. Herrington, physicochemical studies of milk products; R. F. Holland, market milk and related products; W. K. Jordan, dairy engineering, ice cream, and concentrated milk products; F. V. Kosikowski, biochemistry, bacteriology, and technology of dairy products; Vladimir N. Krukovsky, chemistry of milk and fat-containing food products; R. P. March, handling of milk on the farm and in the fluid milk plant; H. B. Naylor, dairy bacteriology; W. F. Shipe, Jr., chemical studies of dairy products; J. C. White, sanitary and technical problems of milk and milk products.

Those intending to major in dairy science should have preparation in calculus; physics; bacteriology; qualitative, quantitative, and organic chemistry; and elementary courses in dairy industry.

Those intending to major in dairy chemistry should offer calculus; physics; qualitative, quantitative, organic, and physical chemistry. Training in dairy industry is desirable but not essential. Deficiency in any of the subjects listed is not necessarily a bar to admission, but it may increase the time needed to earn the degree.

In general, graduate students are expected to acquire a broad knowledge of the chemical, physical, and biological properties of milk and its products. However, mastery of the subject material and the acquisition of residence units alone are not sufficient to earn the degree. Candidates must show that they have matured as students, and that they are able to conduct independent and intensive study in the laboratory and in the library.

ENTOMOLOGY AND LIMNOLOGY *(AG.)*

Professors C. O. Berg, J. L. Brann, F. H. Butt, W. L. Coggshall, J. E. Dewey, Henry Dietrich, E. J. Dyce, H. E. Evans, J. G. Franclemont, G. G. Gyrisco, J. D. Hood, R. R. Kriner, A. A. LaPlante, J. G. Matthysse, J. A. Naegele, C. E. Palm, R. L. Patton, David Pimentel, W. A. Rawlins, *H. H. Schwardt,* Maurice Semel, B. V. Travis, L. D. Uhler, T. C. Watkins, D. A. Webster, M. H. J. Weiden, P. H. Wooley, R. G. Young. At Geneva: *Professors* J. A. Adams, P. J. Chapman, A. C. Davis, R. W. Dean (at Poughkeepsie), F. L. Gambrell, E. H. Glass, G. E. R. Hervey, S. E. Lienk, F. L. McEwen, F. G. Mundinger, E. H. Smith, E. F. Taschenberg (at Fredonia).

APPROVED MAJOR AND MINOR SUBJECTS

Apiculture 1, 2, 3, 4
Insect Ecology 1, 2, 3, 4
Economic Entomology 1, 2, 3, 4
Insect Morphology and Histology 1, 2, 3, 4
Insect Embryology 1, 2, 3, 4
Insect Taxonomy 1, 2, 3, 4
Insect Physiology 1, 2, 3, 4
Insect Toxicology 1, 2, 3, 4
Insecticide Chemistry 1, 2, 3, 4
Medical Entomology 1, 2, 3, 4
Parasitology 1, 2, 3, 4
Limnology 1, 2, 3, 4
Entomology 4

Language requirement for the Master's degree: proficiency in one language before the last term or exemption by the Special Committee.

To undertake graduate study the student should not only be prepared in the fundamentals of animal biology and related fields but also have or acquire a foundation in the particular phase of the subject which he intends to pursue. In the summer, members of the staff are prepared to direct the research of graduate students in connection with the Summer Session of Cornell University.

Special facilities for research include the Comstock Memorial Library of over 30,000 volumes and the Everett Franklin Phillips Beekeeping Library of more than 3,000 volumes, each supplemented by thousands of reprints; sets of practically every entomological serial ever published; an extensive insect collection of North American and exotic insects, mostly determined by specialists and especially rich in Lepidoptera, Hymenoptera, Coleoptera, Odonata, and many other orders; and an insectary for research on problems related to insect biology, ecology, toxicology, and the chemistry of insecticides.

FLORICULTURE AND ORNAMENTAL HORTICULTURE *(AG.)*

Professors R. C. Andreasen, J. F. Cornman, R. E. Lee, L. H. MacDaniels, J. P. Nitsch, J. P. Porter, A. M. S. Pridham.

APPROVED MAJOR AND MINOR SUBJECTS

Floriculture and Ornamental Horticulture: 1, 2, 4

Language requirement for Master's degree: proficiency in either French or German before completion of second residence unit, or a substitute approved by the candidate's Special Committee.

Members of the staff of this field are concerned with greenhouse crops, nursery crops, turfs, plant materials, breeding of ornamental plants, and the problems of landscaping as applied to small properties.

Since many of the problems dealing with greenhouses and nursery crops, turf, and the breeding of ornamental plants are basically those of plant response with relation to the environment, it is expected that the entering graduate student will have adequate preparation in elementary horticulture, botany, plant physiology,

genetics, pathology, agronomy, entomology, chemistry and physics. Studies relating to the propagation, nutrition, culture and improvement of ornamental plants may be undertaken as research for an advanced degree and should be approached from the standpoint of the basic sciences. Consequently it is appropriate to select minor fields of study from physiology, anatomy, morphology, taxonomy, pathology, genetics, agronomy, entomology, agricultural economics, agricultural engineering, etc.

Studies involving the use of plant materials and problems of design relating to landscape service for small properties may be suitable, in which case it is expected that the student will have an adequate background in the basic principles of horticulture and plant science as well as in design and drawing.

Graduate students interested in problems concerned with the revision of taxonomic groups of ornamental plants are referred to the section of this Announcement describing the facilities of the L. H. Bailey Hortorium (page 65).

FOOD AND NUTRITION *(H.E.)*

Professors A. M. Briant, W. L. Clark, F. Fenton, H. M. Hauck, *F. A. Johnston,* K. Longree, R. N. Lutz, C. M. McCay, N. Mondy, C. J. Personius, G. Steininger, C. M. Young.

APPROVED MAJOR AND MINOR SUBJECTS

Food and Nutrition 1, 2, 4
Nutrition 1, 2, 3, 4
Food 1, 2, 3, 4
General Home Economics 5

Students with a major or minor in the field of Food and Nutrition may select from a variety of courses, seminars, and experiences in independent study. Each student plans his program in consultation with his special committee, after consideration of his previous background and purpose in graduate study.

A candidate wishing to major in this field whose studies include training equivalent to that of an undergraduate major in the Department of Food and Nutrition (basic courses in food and nutrition, biochemistry, bacteriology, and physiology) may begin graduate studies in his major field immediately. A student whose preparation is deficient in several areas may be required to make up deficiencies during a period of study as a provisional candidate.

Inquiries should be addressed to the Graduate Representative, Food and Nutrition, Van Rensselear Hall, Cornell University.

Members of the staff will direct research in the following areas: Professors Briant, Clark, Fenton, Longree, Mondy, and Personius—studies in food; Professors Hauck, Johnston, Lutz, McCay, and Steininger—studies in nutrition.

FOOD TECHNOLOGY *(AG.)*

Professors at Geneva: F. P. Boyle, *D. B. Hand,* G. J. Hucker, Z. I. Kertesz, F. A. Lee, J. C. Moyer, C. S. Pederson, W. B. Robinson, D. E. Wilson.

APPROVED MAJOR AND MINOR SUBJECT

Food Technology 1, 2, 4

Students planning graduate study in food technology should have preparation in one of the following fields: bacteriology, chemistry, or engineering. Well equipped laboratories and pilot plant facilities are available for research in canning, freezing, dehydration, fermentation, unit processes, sanitation and quality control.

GENERAL BIOLOGY *(AG.)*

Professors J. D. Hood and *L. D. Uhler.*

APPROVED MAJOR AND MINOR SUBJECT

General Biology 2, 4

The M.S. degree in general biology is offered especially for those students who are graduates of small colleges, whose subject matter in the biological sciences is limited, and who plan to teach in small colleges or high schools. It is not offered for those students who plan to do research in a subject matter field of the biological sciences except as a minor to round out their background.

PLANT BREEDING *(AG.)*

Professors R. E. Anderson, S. S. Atwood, H. L. Everett, W. T. Federer, N. F. Jensen, A. A. Johnson, E. D. Kinbacher, C. C. Lowe, H. M. Munger, *R. P. Murphy,* R. L. Plaisted, D. S. Robson, H. H. Smith, A. M. Srb, R. G. D. Steel, R. G. Wiggans, T. L. York. At Geneva: *Professors* J. D. Atkin, D. W. Barton, J. Einset, K. W. Hanson, R C. Lamb, G. L. Slate.

APPROVED MAJOR AND MINOR SUBJECTS

Plant Breeding 1, 2, 4 Genetics 1, 2, 4
Biometry and Statistics 3, 4

Language requirement for the Master's degree: proficiency in one language, before completion of second residence unit, or substitute approved by the Field.

Students who are interested in crop improvement through breeding will register in *plant breeding.* Problems for research may involve studies of breeding technics, the application of genetic principles to breeding, and the correlation of knowledge from other fields in attacks on problems such as yield, quality, adaptability, and disease and insect resistance. The department now has active research projects with most of the important field and vegetable crops of New York, and certain materials from these are available for graduate student problems. Those students interested in theoretical phases will register in *genetics,* and their research problems generally will deal with genic and chromosomal analyses of hereditary and evolutionary phenomena. Almost any suitable biological materials can be utilized, but the most readily available ones will be those currently being studied by the departmental staff in genetic investigations. For those students to whom problems of experimental technic and mathematical analysis of biological data hold the greater appeal, registration for a minor will be in *biometry and statistics,* and for a major will be in the Field of Statistics (p. 59).

It is advisable that the student entering upon graduate work be well grounded in the fundamentals of the natural sciences. He should have had elementary courses in inorganic and organic chemistry, college algebra, botany or zoology or biology, and plant, animal, or human physiology. Students intending to specialize in biological statistics will find it to their advantage to have additional training in mathematics. Broad training and experience in the field of agriculture are essential for those planning to major in the field of plant breeding.

Students majoring in plant breeding or genetics will find it necessary to remain in Ithaca during the summer, or to make satisfactory arrangements for growing and studying elsewhere the material used in connection with their research problems.

Members of the staff will be especially interested in directing research in the field as listed, although research will not be limited to these fields: Professor Atwood, forage crops—cytogenetics; Professor Murphy, forage crops—genetics and breeding; Professor Lowe, forage crops—breeding; Professor Anderson, forage crops—genetics and breeding; Professor Jensen, small grains—genetics and breeding; Professor Kinbacher, small grains—winter hardiness; Professors Munger and York, vegetable crops—genetics and breeding; Professor Plaisted, potatoes—genetics and cytogenetics; Professor Everett, corn genetics and breeding; Professor Wiggans, corn breeding; Professor Johnson, extension and pure seed programs; Professor Smith, plant genetics and evolution; Professor Srb, biochemical genetics; Professor Federer, bio-

logical statistics and design of experiments; Professor Steel, biological statistics and multivariate analysis; and Professor Robson, biological statistics. Prospective students will find it to their advantage to correspond with the staff member whose interests are most closely related to their own some months in advance of the time they wish to enter, since only a limited number of students can be accommodated.

PLANT PATHOLOGY *(AG.)*

Professors C. W. Boothroyd, W. H. Burkholder, A. B. Burrell, R. S. Dickey, A. W. Dimock, K. H. Fernow, *G. C. Kent,* R. P. Korf, W. F. Mai, L. M. Massey, W. D. Mills, P. E. Nelson, A. G. Newhall, K. G. Parker, L. C. Peterson, D. A. Roberts, A. F. Ross, A. F. Sherf, L. J. Tyler, D. S. Welch, R. E. Wilkinson, C. E. Williamson, P. H. Wooley. At Geneva: *Professors* A. J. Braun, W. F. Crosier, R. M. Gilmer, J. M. Hamilton, J. J. Natti, D. H. Palmiter (at Poughkeepsie), W. T. Schroeder, M. Szkolnik.

APPROVED MAJOR AND MINOR SUBJECTS

(The Faculty usually does not advise a minor in one of these subjects when the major is in the other.)

Mycology 1, 2, 3, 4 Plant Pathology 1, 2, 3, 4

Language requirements for Master's degree: proficiency in French or German before completion of second residence unit, or substitute approved by the Field.

Majors in plant pathology are expected to become familiar with the principles underlying the initiation of infection by the major groups of plant pathogens (bacteria, fungi, viruses, and nematodes), the course of infection, the relation of environment to disease, the principles and methods of disease control, and the interrelation of pathogen and suscept. The student must become familiar with the various techniques useful in studying the details of the diseases and of their control. Individual research will be carried on in one area of the field. Students should spend their summers in field work under professors' direction in order to come into contact with diseases under natural conditions and the practical aspects of control. They should have some practice in teaching. Candidates should have a knowledge of elementary physics, inorganic chemistry, organic chemistry, general botany, plant histology and anatomy, and plant physiology. Opportunity is afforded for further study in these fields, but students with deficiencies cannot expect to complete work for the degree in the minimum amount of residence.

Majors in mycology are expected to become familiar with the broad field of mycology, including morphology, taxonomy, physiology, genetics, and cytology. It is expected that the student will become proficient in the various techniques used in the study of fungi. Individual research will be concentrated in one phase of the field. Students will profit by spending their summers in the field, collecting and examining fungi in the fresh state. Candidates should possess a thorough grounding in general botany. Opportunity is afforded for further study in related fields, such as taxonomic botany, morphology and anatomy, microtechnique, plant physiology, biochemistry, genetics, and cytology.

A limited number of assistantships providing opportunities for research and teaching are available in the department.

POMOLOGY *(AG.)*

Professors D. Boynton, *L. J. Edgerton,* E. G. Fisher, A. J. Heinicke, M. B. Hoffman, R. M. Smock. At Geneva: *Professors* K. D. Brase, J. C. Cain, O. F. Curtis, J. Einset, C. G. Forshay, K. W. Hanson, R. C. Lamb, N. J. Shaulis, G. L. Slate, J. P. Tomkins, R. G. Way.

APPROVED MAJOR AND MINOR SUBJECTS

Pomology 1, 2, 4

Laboratory, greenhouse, orchard, and cold storage facilities at Ithaca and Geneva are available for graduate study. Special facilities for research in fruit breeding, nursery stock investigations, and other phases of pomology are also available at Geneva.

Minor subjects may be such as plant physiology, plant anatomy, cytology, soil chemistry, soil physics, biochemistry, and chemistry. One minor in botany, particularly plant physiology, is urged.

To enter upon graduate work, the student should have the equivalent of the following courses: general botany, elementary plant physiology, economic entomology, elementary plant pathology, introductory inorganic and elementary organic chemistry, elementary pomology, and systematic pomology.

Candidates for the Master's degree should spend one summer at Ithaca or Geneva or in the field investigating their special subject. At least two summers of work are expected of candidates for the doctorate.

POULTRY HUSBANDRY *(AG.)*

Professors J. H. Bruckner, R. K. Cole, G. F. Heuser, F. W. Hill, F. B. Hutt, S. C. King, L. C. Norris, A. L. Romanoff, M. L. Scott, A. van Tienhoven.

APPROVED MAJOR AND MINOR SUBJECTS

Animal Genetics (see page 62)
Animal Nutrition (see page 63)
Chemical Embryology 1, 2, 3, 4
Poultry Husbandry 2, 4

It is desirable that graduate students electing a major subject in these fields should have had some undergraduate training in poultry husbandry, some experience in that field, and courses in zoology or animal biology, physiology, physics, and chemistry. Other requirements will be specified by the major adviser.

It is recommended that those candidates for the Master's degree who expect to become candidates for the doctorate study one or more foreign languages.

PSYCHOLOGY *(ARTS)*

Professors A. L. Baldwin, G. W. Boguslavsky, U. Bronfenbrenner, R. H. Dalton, F. S. Freeman, J. J. Gibson, J. E. Hochberg, W. W. Lambert, H. S. Liddell, R. B. MacLeod, *T. A. Ryan,* P. C. Smith, R. D. Walk, A. L. Winsor.

APPROVED MAJOR AND MINOR SUBJECTS

Comparative Psychology 1, 2, 3, 4
Differential Psychology and Psychological Tests 1, 2, 3, 4
Experimental Psychology 1, 2, 3, 4
Experimental Psychopathology 1, 2, 3, 4
General Psychology 2, 4
History of Psychology and Systematic Psychology 1, 2, 3, 4
Industrial Psychology 1, 2, 3, 4
Personality and Social Psychology 1, 2, 3, 4

Language requirement for the Master's degree: proficiency in French or German before the final examination.

The research laboratories of the Department of Psychology *(Arts)* are located in Morrill Hall and at the Cornell Behavior Farm. Additional research facilities are provided by the Department of Sociology and Anthropology *(Arts),* the Department of Child Development and Family Relationships *(H.E.),* the School of Education *(Ed),* and the School of Industrial and Labor Relations *(I.L.R.).* Since much of the graduate instruction and research in psychology is conducted co-operatively, the prospective student should consult the Announcements of each of these departments.

SEED TECHNOLOGY *(AG.)*

Professors at Geneva, *B. E. Clark,* W. F. Crosier, D. D. Dolan, L. W. Nittler.

APPROVED MAJOR AND MINOR SUBJECTS

Seed Technology 1, 2, 4

The Department of Seed Investigations at the Geneva Experiment Station has laboratory, greenhouse, and trial ground facilities for research in various aspects of seed technology including seed identification, seed purity determinations, dormancy and germination of seeds, detection of seed-borne diseases, measurement of genetic purity, and the evaluation and preservation of germ plasm. A student desiring training in the field of seed technology may select a thesis problem in this field and conduct research at Geneva.

STATISTICS *(AG., ARTS, ENG., I.L.R.)*

(See page 59).

VEGETABLE CROPS *(AG.)*

Professors A. R. Hamson, *J. D. Hartman,* F. M. R. Isenberg, W. C. Kelly, M. W. Meadows, P. A. Minges, H. M. Munger, E. B. Oyer, A. J. Pratt, G. J. Raleigh, Ora Smith, Raymond Sheldrake, R. D. Sweet, T. L. York. At Geneva: *Professors* J. D. Atkin, D. W. Barton, C. B. Sayre, W. T. Tapley, M. T. Vittum. At Riverhead: *Professors* S. L. Dallyn, R. L. Sawyer.

APPROVED MAJOR AND MINOR SUBJECTS

Vegetable Crops 1, 2, 4

Research and study in Vegetable Crops is the application of fundamental scientific knowledge and methods to the solution of the problems of production and handling in the vegetable industry. Types of work involved include studies of control of flowering and fruiting; development and adaptation of varieties; field plot technique; chemical weed control; the use of plant growth regulators; major and minor element fertilization, irrigation, and other soil management practices; physiological diseases; effects of cultural practices and methods of harvesting, shipping, packaging, storing, and merchandising on quality; taste panel techniques; and development and standardization of objective tests for quality. In many cases students do basic research in physiology, biochemistry, genetics, or the like in attempting to solve problems.

To enter upon graduate work in Vegetable Crops it is not necessary for the student to have done his undergraduate work in horticulture. More important, in some cases, is a good background in basic sciences, interest in the plant side of agriculture, and, often, farm experience. It is expected, however, that by the time he has completed his graduate training the student will have a broad knowledge of the whole field of Vegetable Crops. Work on a Vegetable Crops major may also require a considerable amount of study in certain fields, such as statistics, plant physiology, or biochemistry, other than those in which he is minoring.

Students expecting to continue their graduate studies should prepare to meet the language requirement for the doctorate during the course of their preparation for the Master's degree.

VETERINARY MEDICINE *(VET.)*

Professors D. W. Baker, J. A. Baker, J. Bentinck-Smith, D. W. Bruner, A. G. Danks, D. D. Delahanty, R. W. Dougherty, H. H. Dukes, J. A. Dye, H. E. Evans, Julius Fabricant, M. G. Fincher, F. H. Fox, J. H. Gillespie, H. L. Gilman, R. E. Habel,

W. A. Hagan, M. R. KARE, R. W. KIRK, E. P. LEONARD, P. P. LEVINE, K. MCENTEE, M. E. MILLER, J. M. MURPHY, L. L. NANGERONI, P. OLAFSON, M. C. PECKHAM, C. G. RICKARD, S. J. ROBERTS, J. H. WHITLOCK.

APPROVED MAJOR AND MINOR SUBJECTS

Veterinary Anatomy 1, 2, 3, 4
Animal Physiology 1, 2, 3, 4
Veterinary Pathology 1, 2, 3, 4
Pathogenic Bacteriology 1, 2, 3, 4
Veterinary Virology 1, 2, 3, 4
Parasitology 1, 2, 3, 4
Veterinary Medicine 1, 2, 3, 4
Veterinary Obstetrics and Diseases of the Reproductive Organs 1, 2, 3, 4
Veterinary Surgery 1, 2, 3, 4

For candidates for the Master's degree a reading knowledge of German and French or Spanish is very desirable but not required.

ZOOLOGY *(ARTS)*

Professors H. B. Adelmann, J. M. ANDERSON, L. C. COLE, P. W. GILBERT, S. L. LEONARD, H. A. SCHNEIDERMAN, M. J. SINGER, W. A. WIMSATT.

APPROVED MAJOR AND MINOR SUBJECTS

Comparative Anatomy 1, 2, 3, 4
Comparative and Cellular Physiology 1, 2, 3, 4
Comparative Neurology 1, 2, 3, 4
Ecology 1, 2, 3, 4
Endocrinology 1, 2, 3, 4
Histology and Embryology 1, 2, 3, 4
Invertebrate Zoology 1, 2, 3, 4

Language requirement for the Master's degree: proficiency in German or French.

The Department of Zoology offers excellent opportunities for graduate study and research in all phases of zoology, but particularly in the descriptive and experimental aspects of the following special fields: (1) Comparative and Human Anatomy, with emphasis on the functional approach; (2) Comparative and Cellular Physiology; (3) General Ecology; (4) Endocrinology; (5) Histology and Embryology; (6) Invertebrate Zoology; and (7) Comparative and General Neurology. Members of the staff are especially qualified to direct research in the special fields listed, but research need not be limited to these fields. The research interests of the members of the staff are broad, but, in general, they may be summarized as follows: H. B. Adelmann, experimental embryology and the history of embryology; J. M. Anderson, general and comparative anatomy of invertebrates, with emphasis on the functional histology and histochemistry of organ systems; L. C. Cole, general ecology with special emphasis on population phenomena and the mathematical theory of populations; P. W. Gilbert, vertebrate functional anatomy, i.e., correlation of habits and activities of vertebrates with their morphology, origin and evolution of the vertebrate extrinsic ocular muscles; S. L. Leonard, general endocrinology with special emphasis on the anatomical, physiological, and biochemical aspects of the mechanisms of hormone action, reproduction, growth and metabolism; H. A. Schneiderman, cellular and comparative physiology, metamorphosis, respiration, and intermediary metabolism of insects, tissue culture, oxidative enzymes, physiological and biochemical effects of radiation; M. J. Singer, general and comparative neurology, experimental morphology, problems of growth and regeneration, and the physical chemistry of dye and protein interactions; W. A. Wimsatt, histology, histophysiological and histochemical approach to problems of reproduction, comparative placentation, and hibernation.

Applicants for graduate study in zoology must take the Graduate Record Examination Aptitude and Profile Tests in sufficient time to permit consideration of the results along with the application for admission into the Graduate School.

All applicants should have completed the equivalent of a well-rounded college major in zoology, and should have some foundation in the particular phase of

zoology it is desired to pursue. Courses in organic chemistry and elementary physics should also have been completed. Although an exceptional student may be admitted without having completed the above requirements, he should then expect to remain in residence beyond the minimum period to make up the deficiencies.

In addition to the courses offered by the Department of Zoology *(Arts)*, other courses of study that are often valuable to graduate students (either as individual courses or as minor subjects) are: chemistry (especially organic and physical chemistry), geology, mathematics, psychology and physics *(Arts);* bacteriology, biochemistry, botany, conservation, entomology, genetics (Department of Plant Breeding), and physiology of reproduction (Department of Animal Husbandry) *(Ag.);* and physiology *(Vet.)*.

PHYSICAL SCIENCES

AERONAUTICAL ENGINEERING *(ENGIN.)*

Professors A. R. Kantrowitz, Y. H. Kuo, C. Riparbelli, N. Rott, *W. R. Sears.*

APPROVED MAJOR AND MINOR SUBJECTS

Aeronautical Engineering 1, 3, 4 Aerodynamics 4

In this field of graduate study emphasis is placed on the aeronautical sciences rather than mere proficiency in present-day techniques. Consequently, graduate students having aeronautical engineering as their major subject will be urged to select as their minor subjects the basic sciences, such as mathematics, physics, and mechanics.

Much of the research carried out in this field at Cornell is concerned with fundamental problems in the dynamics of fluids. Whenever possible, these investigations combine the techniques of theory and laboratory experiment, making use of the experimental facilities of the Graduate School of Aeronautical Engineering, on the campus. In every investigation, an attempt is made to correlate theory with observation and practical experience.

A group working under the direction of Professor Kantrowitz is investigating the dynamics of gases at extreme temperatures. Generally speaking, their interests lie in matters in which the phenomena of atomic physics are finding application to the aerodynamics of propulsion systems and of flight at extreme speeds. This brings the group into close contact with several other departments in the University. Another group, which includes Professors Kuo, Rott, and Sears, is carrying out research on subjects basic to modern wing theory and power plant theory. These include investigations of the turbulent boundary layer and of three-dimensional boundary-layer problems in general. Other investigations typical of the group's activities are shock-boundary-layer interaction and unsteady flow about wings and rotating compressors. Under Professor Riparbelli's direction, research is being pursued in several areas of the structural field, including the deformations of sweptback and low-aspect-ratio wings under load and some problems of structural dynamics. These investigations are both theoretical and experimental.

Candidates for the Ph.D. with a major in this field who do not already hold the Master's degree will be encouraged to matriculate first as candidates for the professional degree, M.Aero.E., under the jurisdiction of the Graduate School of Aeronautical Engineering. Information concerning this School and the degree M.Aero.E. will be found in the *Announcement of the College of Engineering.*

ASTRONOMY *(ARTS)*

Professors J. P. Cox, *R. W. Shaw.*

APPROVED MAJOR AND MINOR SUBJECTS

Astronomy 1, 2, 4 Astrophysics 1, 2, 4

Language requirement for the Master's degree: proficiency in French or German.

Applicants for admission are required to offer the equivalent of introductory astronomy, six hours of interpretational astronomy, six hours of electives in the Field of Astronomy, and evidence of the completion of sufficient work in physics and mathematics to assure the successful pursuance of advanced work in astronomy.

Candidates for the degree of Doctor of Philosophy with a major in astronomy or

astrophysics are required to take one minor in physics unless a divided major is granted. In special cases a major in astronomy or astrophysics may consist partly of selected courses in physics. In such cases one minor need not be in physics.

Candidates electing a minor in the Field may select such courses as meet their requirements, provided the necessary prerequisites are offered.

Students with advanced standing in the sciences or in mathematics who do not desire to major or minor in astronomy may be admitted after consultation with the professor in charge to such courses in astronomy as seem desirable.

The staff is particularly interested in research in geodetic astronomy, stellar spectroscopy, lunar photometry, and theory of stellar interiors.

CHEMICAL ENGINEERING *(ENGIN.)*

Professors R. K. Finn, P. Harriott, J. E. Hedrick, C. W. Mason, F. H. Rhodes, J. C. Smith, R. G. Thorpe, R. L. Von Berg, H. F. Wiegandt, *C. C. Winding.*

APPROVED MAJOR AND MINOR SUBJECTS

Chemical Engineering 1, 2, 4

To qualify for admission, a student must have completed satisfactorily a course substantially equivalent in its technical content to the course leading to the degree of Bachelor of Chemical Engineering at Cornell University. Exact equivalency, subject for subject and credit hour for credit hour, is neither required nor expected, but the previous training must be such as to prepare the applicant for effective work in chemical engineering at the graduate level.

However, for candidates centering their instruction and research in chemical microscopy, undergraduate training in chemical engineering is not required.

Minor subjects may be chosen, for example, from metallurgical engineering or other divisions of engineering, chemistry, physics, mathematics, business and public administration, or industrial and labor relations.

Candidates are expected to pursue a course of study that will give them a deeper comprehension of the basic and applied sciences and will develop initiative, originality, and creative ability. Graduate courses are offered in thermodynamics, reaction kinetics, economics, statistics, the unit operations of chemical engineering, petroleum refining, and the chemistry and technology of rubbers and plastics. Specific programs are planned to fit the objectives of the student and to develop original thinking. The student is not required to take an arbitrarily fixed series of courses.

Research work for the thesis may be in the specific fields of unit operations, thermodynamics, reaction kinetics, chemical processes, design, chemical engineering economics, petroleum processes, rubber, or plastics.

CHEMISTRY *(ARTS)*

Professors S. H. Bauer, R. Bersohn, A. T. Blomquist, W. D. Cooke, R. M. Diamond, D. A. Dows, P. J. Flory, R. M. Hexter, *J. L. Hoard,* J. R. Johnson, A. W. Laubengayer, F. A. Long, J. Meinwald, W. T. Miller, M. L. Nichols, D. D. Phillips, R. A. Plane, R. F. Porter, H. A. Scheraga, M. J. Sienko, B. Widom.

APPROVED MAJOR AND MINOR SUBJECTS

Inorganic Chemistry 1, 2, 3, 4
Analytical Chemistry 1, 2, 3, 4
Organic Chemistry 1, 2, 3, 4
Physical Chemistry 1, 2, 3, 4

Language requirement for the Master's degree: proficiency in French or German or an approved substitute.

The program of graduate study in chemistry is designed to give a broad training in the fundamental knowledge of chemistry and in methods of research. A graduate student will ordinarily pursue these objectives by taking advanced courses, by participation in organized and informal seminars and discussions with his associates and Faculty members, and by carrying out and reporting on a research project in his major field. Upon completion of their study program, graduates normally go out to positions in research laboratories or to positions involving teaching and research.

Candidates for the degree of Master of Arts, Master of Science, or Doctor of Philosophy with major in chemistry will be expected to offer for admission the equivalent of an A.B. degree with a major in chemistry. Such training should include courses in general chemistry, qualitative and quantitative analysis, organic chemistry, physical chemistry, and mathematics and physics. Some experience with foreign languages, preferably German and either French or Russian, is also regarded as essential. In admitting students, emphasis is placed on quality of performance and promise for research as judged by those best acquainted with applicants. Unusually promising students may be admitted with deficiencies in undergraduate training. In such cases work designed to make up the deficiencies will be required and more than the usual period of residence may be necessary.

Proficiency tests will be required of all entering candidates for advanced degrees (M.S. or Ph.D.) with a major in chemistry. These tests are given a few days before registration for the fall term and cover the divisions of inorganic, analytical, organic, and physical chemistry. Each test will be about two and one-half hours in length and will cover material normally presented in elementary courses in the subjects listed above. The results of these tests will be used to aid the student's Special Committee in the planning of his program of study. While the results will not be considered in the usual sense of "passing" or "failing," low marks in one or more of the tests may require a preponderance of elementary courses during a term.

Graduate students are encouraged to carry on research during part of the summers and a number of Summer Research fellowships are available for this purpose.

Graduate students are required to register with the Department of Chemistry on the registration days at the beginning of each term. Entering students will consult with the chairman of the departmental Graduate Scholarship Committee at this time.

In addition to the courses in chemistry *(Arts)*, attention is directed to courses in chemical engineering, including chemical microscopy *(Engin.)*, and to work in biochemistry, offered in the College of Agriculture.

A graduate student who desires to take a minor subject in chemistry with a major subject from some field other than chemistry will be required to offer or acquire a satisfactory background for advanced work. This will ordinarily consist of an introductory course in general chemistry and of intermediate courses prerequisite to advanced work in the minor subject in chemistry. The work in his minor subject in chemistry comprises advanced study planned with the approval of his Special Committee.

Specific inquiries from prospective graduate students are welcomed and should be addressed to the representative or to any member of the Faculty. Applications for teaching or research assistantships should be addressed to the Chairman of the Department of Chemistry, Baker Laboratory.

CIVIL ENGINEERING *(ENGIN.)*

Professors D. J. Belcher, P. P. Bijlaard, M. Bogema, *N. A. Christensen,* C. Crandall, G. P. Fisher, C. D. Gates, J. C. Gebhard, H. M. Gifft, W. L. Hewitt, B. K. Hough, H. T. Jenkins, A. L. Jorissen, T. D. Lewis, W. O. Lynch, G. B. Lyon, W. McGuire, A. J. McNair, M. S. Priest, L. Reid, F. J. Spry, G. Winter.

APPROVED MAJOR AND MINOR SUBJECTS

Drawing and Cartography 4
Geodetic and Photogrammetric Engineering 1, 2, 3, 4
Hydraulics 1, 2, 3, 4
Hydraulic Engineering 1, 2, 3, 4
Management Engineering 1, 2, 3, 4
Sanitary Engineering 1, 2, 3, 4
Sanitary Sciences 3, 4
Structural Engineering 1, 2, 3, 4
Soils Engineering 1, 2, 3, 4
Transportation Engineering 1, 2, 3, 4
Aerial Photographic Studies 2, 3, 4

To be admitted for graduate study in any of the fields of civil engineering, an applicant should ordinarily hold a Bachelor's degree in civil engineering from a school of recognized standing. However, arrangements may be made for exceptional cases when a student with undergraduate training in a different field, such as another branch of engineering, architecture, or the physical sciences, wishes to pursue graduate work in civil engineering. In such cases, additional residence may be required by the candidate's Special Committee. To be admitted the applicant must have been in at least the upper half of his class, or he must present other evidence which demonstrates his fitness to carry on graduate work.

The aim of graduate work in the studies grouped under civil engineering is not only to increase the student's proficiency in the more advanced phases of professional practice, but also to promote a deeper and broader understanding of the theoretical and empirical basis of the field, including in many cases the boundaries of present knowledge.

In addition to formal courses, individual work under personal direction by members of the staff is available.

Drawing and Cartography. The Department offers advanced drawing courses which may be adjusted to the needs of a particular student. Cartography and map reproduction are closely allied with the mapping requirements of topographers, geologists, and social scientists.

Geodetic and Photogrammetric Engineering. The Geodetic and Photogrammetric Engineering Department offers a considerable number of advanced courses in topographic engineering, geodesy, geodetic engineering, photogrammetry, theory of errors, and land surveying. Courses in related fields with special application to surveying problems are available in other departments of the University, such as in astronomy, physics (optics and photography), mathematics, and geology *(Arts)*, in regional and city planning *(Arch.)*, and in real property *(Law)*.

Hydraulics and Hydraulic Engineering. The Department of Hydraulics and Hydraulic Engineering offers a complete sequence of advanced courses in theoretical and experimental hydraulics, covering the subjects of hydrodynamics, advanced hydraulics, flow in open channels, hydraulic measurements, hydraulic models, pumps and turbines. Courses listed in hydraulic engineering deal with hydraulic structures, water power, flood control, erosion and sedimentation, rivers and harbors. Formal teaching is supplemented by informal discussions, demonstrations, laboratory experiments, and field trips. Seminars are held regularly with the participation of the staff, of graduate students, and of distinguished visitors.

In the Hydraulic Laboratory facilities are available for research and thesis work. Not infrequently, graduate students find part-time employment on laboratory projects. The Elon Huntington Hooker Scholarship in Hydraulics is available for research in this field. Graduate students may broaden their education by work in the allied fields of structural engineering, soils engineering, mechanical engineering, aeronautical engineering, agricultural engineering, mathematics, etc.

Management Engineering. Graduate study in management is intended to supplement the civil engineer's basic technical training with advanced studies in principles of management, economics, finance, and business law. These types of study are of

importance in such work as public administration, regional planning, city management, public housing, and valuation, as well as for the efficient and successful management of industry, construction contracting, and other lines of business with which the engineer may be connected.

SANITARY ENGINEERING. The Department offers a number of formal advanced courses in water supply, sewerage, industrial wastes, public health, sanitary biology, and chemistry in addition to supervision of informal courses in design and subjects of interest to special students. For the engineering student interested in the contributing sciences, minor work is available both in chemistry, bacteriology, biology, and fluid mechanics. Special programs are arranged for students majoring in such subjects as conservation, medical entomology, nutrition, hydraulics, and chemical and other engineering fields.

STRUCTURAL ENGINEERING AND SOILS ENGINEERING. The Department of Structural and Soils Engineering offers a considerable number of advanced courses in the field of structural analysis and design, and in soils and foundation engineering. In addition, courses in the fields of elasticity, stability, plasticity, applied mathematics, engineering materials, and other subjects are available in the Department of Mechanics and Engineering Materials *(Engin.)* and in the Department of Mathematics *(Arts)*. Courses on airplane structures are available in the Graduate School of Aeronautical Engineering. Courses in soils engineering may be supplemented by instruction in closely allied subjects such as Transportation *(Engin.)*, Geology *(Arts)*, and Agronomy *(Ag.)*.

Experimental facilities include a large special bay for three-dimensional full-scale testing, and testing machines up to 400,000-pound capacity with height up to 20 feet, strain gage equipment of all current types, and special laboratories for structural model analysis and soil mechanics.

The Department regularly employs graduate students for assistance in theoretical and experimental work on research projects sponsored by government and private agencies.

TRANSPORTATION ENGINEERING. The formal offerings of the Department are contained in four general categories: highway engineering, four courses; traffic engineering, three courses; airport engineering, one course; and aerial photographic studies, two courses. The staff also offers additional instruction in various branches of aerial photographic studies, including engineering soil survey, construction planning, ground water, agricultural surveys for irrigation in arid areas, and advanced work in mineral surveys. The formal offerings in traffic engineering are supplemented both by advanced instruction within the Department and by course work in regional planning.

Laboratories are available for graduate study and research in bituminous materials, aggregates, soils, and other highway materials. Laboratory and field facilities are fully developed for aerial photographic studies and traffic engineering. Considerable emphasis is placed upon field work and practical experience. Opportunities for both are available for all phases of transportation engineering.

Students on leave from professional assignments may adjust their programs to fit their special interests and research problems.

ELECTRICAL ENGINEERING *(ENGIN.)*

Professors P. D. ANKRUM, H. G. BOOKER, N. H. BRYANT, L. A. BURCKMYER, C. R. BURROWS, M. COHEN, W. W. COTNER, C. L. COTTRELL, *A. B. Credle*, S. C. DWU, W. H. ERICKSON, W. E. GORDON, C. E. INGALLS, S. LINKE, M. G. MALTI, H. S. MCGAUGHAN, M. S. MCILROY, T. MCLEAN, W. E. MESERVE, B. NICHOLS, B. K. NORTHRUP, R. E. OSBORN, J. L. ROSSON, H. G. SMITH, E. M. STRONG, N. M. VRANA, R. D. WILSON, S. W. ZIMMERMAN.

APPROVED MAJOR AND MINOR SUBJECTS

Power Engineering 1, 2, 3, 4
Control Systems Engineering 1, 2, 3, 4
Communication Engineering 1, 2, 3, 4
Illuminating Engineering 2, 3, 4
Electrical Engineering General 1, 2, 3, 4

As prerequisite for graduate work leading to the degree of M.S. or Ph.D. with major in the field of electrical engineering, the candidate should have had the equivalent of the fundamental work required by an accredited undergraduate curriculum in the area of his major subject. The candidate must also supply definite evidence of scholarly interest and aptitude for advanced study. Though the Graduate Record Examination is not required of applicants in the field of Electrical Engineering, applicants may well consider taking this examination, submitting its results along with their application for graduate work.

Considerable latitude is allowed in the selection of the minor subjects, provided that the entire program shows a unified purpose.

Adequate work in advanced physics and mathematics is required of candidates for the degree of Ph.D. It is highly recommended that at least one of the two minor subjects be chosen in the fields of physics or mathematics or in other related fields outside the field of Electrical Engineering.

The approved major and minor subjects listed above, define broad areas in the field of Electrical Engineering within which a student may plan a graduate program which best suits his needs. In addition to the formal courses listed in the *Announcement of the College of Engineering* members of the faculty are prepared to guide individual students in special topics and to arrange seminars for students interested in closely related lines of study and research. Proficiency is expected in all phases of the graduate program.

A graduate student is expected to be capable of advanced study and research within the broad area of the approved major or minor subject that he selects. To define these areas more clearly, the major topics included in each are as follows:

POWER ENGINEERING: Transmission and Distribution of Energy, System Stability, Economics of Utilities, High-Voltage Engineering, Power Generation, Relaying and Control, Electrical Machinery, Power Network Analysis.

CONTROL SYSTEMS ENGINEERING: Electrical Machinery, Industrial Control and Applications, Industrial Electronics, Servomechanisms.

COMMUNICATION ENGINEERING: Communication Systems, Electron Tubes, Microwave Engineering, Radio Wave Propagation, Information Theory, Acoustical Engineering.

ILLUMINATING ENGINEERING: Light Sources, Illumination Design, Vision and Color, Optics, Instrumentation and Measurements.

ELECTRICAL ENGINEERING, GENERAL: Electric Circuit Analysis, Electrical Measurements, Materials in Electrical Engineering, Applied Mathematics, Analogue and Digital Computers.

It is not desirable, nor is it intended, that the boundaries between these areas within the field of Electrical Engineering be too rigidly defined. Rather, every effort is made to allow each student to pursue a program designed to give him a period of broad advanced study. To this end work in such subjects as thermodynamics, fluid mechanics, engineering materials, or engineering physics, to name a few, may be considered as partially fulfilling the requirements for a major or minor in electrical engineering, even though these subjects are not under the direct jurisdiction of the Faculty of the School of Electrical Engineering.

ENGINEERING MATERIALS *(ENGIN.)*

Professors D. F. Gunder, J. O. JEFFREY, J. R. MOYNIHAN, H. S. SACK, F. O. SLATE, D. A. STUART.

APPROVED MAJOR AND MINOR SUBJECTS

Materials of Engineering 1, 2, 3, 4

Engineering materials includes both theoretical and experimental procedures for evaluating the properties of engineering materials. All graduate students are urged to acquire fundamental training in both of these phases. In addition to the courses of the department, many other courses in mechanics and metallurgy *(Engin.)* and physics *(Arts)* should be considered as appropriate and necessary supplements in an adequate training in the field of materials engineering. Laboratory facilities are available for investigations in metals, concrete, cement, concrete aggregate, timber, plastics, fuels, lubricants, and miscellaneous materials.

ENGINEERING MECHANICS *(ENGIN.)*

Professors H. D. CONWAY, E. T. CRANCH, T. R. CUYKENDALL, *D. F. Gunder,* H. C. PERKINS, L. STEG.

APPROVED MAJOR AND MINOR SUBJECTS

Mechanics 1, 2, 3, 4 Fluid Mechanics 1, 2, 3, 4

Graduate study in mechanics serves a twofold purpose. It trains men who intend to teach or to specialize in industrial research. The Faculty believes that both these groups are best served by a broad fundamental training. Although the work in this department is devoted primarily to the mechanics of particles and rigid bodies and of deformable solids, all students are encouraged to take work also in the fields of the mechanics of liquids and gases and in the related fields of materials, physics, and mathematics. Opportunity is provided for graduate students interested in teaching to participate in the teaching program in the University. Opportunity is likewise provided for those primarily interested in industrial research to participate in projects in this field. Candidates planning to complete a Master's degree in one year must have had advanced strength of materials (Engineering 1154) and applied mechanics (Engineering 1155) or the equivalent upon entering.

ENGINEERING PHYSICS *(ENGIN.)*

Professors H. G. BOOKER, C. R. BURROWS, D. D. CLARK, D. R. CORSON, A. B. CREDLE, T. R. CUYKENDALL, D. F. GUNDER, P. L. HARTMAN, M. KAC, A. R. KANTROWITZ, *H. S. Sack,* W. R. SEARS, B. M. SIEGEL, L. P. SMITH.

APPROVED MAJOR AND MINOR SUBJECTS

Engineering Physics 1, 2, 4

The objective of graduate instruction in engineering physics is to offer concentrated study in a field which crosses conventional subject matter boundaries as well as to deepen and enlarge both the general scientific and the engineering background of the student. For this reason, the minor subject or subjects must be outside the field of his major subject and approved by the chairman of the Special Committee.

Though engineering physics undergraduate work is the preferred preparation for graduate work in engineering physics, students with a conventional physics or engineering background are readily accepted. Candidates for a Ph.D. in this field who do not already hold a Master's degree will be requested to matriculate first as candidates for a Master's degree; when they have become better acquainted with the work and the requirements in this field, they may, on the recommendation of their Special Committee, change to Ph.D. candidacy without incurring loss of time.

Course work will be chosen principally from the courses offered in the College of Engineering and in the College of Arts and Sciences (Departments of Physics, Chemistry, Mathematics, etc.). The thesis can be done in any field represented by members of the Engineering Physics Faculty, or, if the candidate's Special Committee approves, in other fields in which engineering physics may be significant.

The members of the department are interested in a wide variety of research problems and the student will therefore find advice and special equipment available in many fields. In the electron microscopy laboratory, under the direction of Professor Siegel, research is conducted on the development of electron microscopy and electron diffraction techniques and their applications to problems in solid state and surface physics. Professors Cuykendall and Sack are interested in the study of the anelastic and plastic properties of solids (metals, ionic crystals, and plastics) and specialized equipment for growing single crystals and for studying their properties at high temperatures is available. Professors Smith, Hartman, and Sack conduct research on electronic properties of semiconductors and insulators, by means of measurements of luminescence, photoconductivity, dielectric properties, etc.; this research is in close connection with similar work going on in the Department of Physics. Professor Clark's interests are in the field of nuclear physics, and he is supervising research in nuclear instrumentation and in certain phases of nuclear power.

While the work just mentioned is supported by funds from, or by contracts with the Department of Engineering Physics, the student may avail himself of research possibilities in other departments through the affiliation of Engineering Physics staff members with these departments. (Professors Smith, Grantham, and Hartman, Department of Physics; Professor Corson, Laboratory of Nuclear Studies; Professor Booker, Burrows, and Credle, School of Electrical Engineering; Professors Kantrowitz and Sears, School of Aeronautical Engineering; Professor Gunder, Department of Engineering Mechanics; Professor Kac, Department of Mathematics). For the areas of interest of these members, and the facilities available, the student is referred to the announcements of these departments in this publication.

GEOLOGY AND GEOGRAPHY *(ARTS)*

Professors A. L. Anderson, J. D. Burfoot, Jr., R. A. Christman, *W. S. Cole,* E. H. Muller, C. M. Nevin, J. W. Wells.

APPROVED MAJOR AND MINOR SUBJECTS

Economic Geology 1, 2, 3, 4
Geography 1, 2, 3, 4
Geomorphology 1, 2, 3, 4
Mineralogy and Petrology 1, 2, 3, 4
Paleontology and Stratigraphy 1, 2, 3, 4
Structural Geology and Sedimentation 1, 2, 3, 4

Language requirement for the Master's degree: proficiency in French or German or an approved substitute.

Applicants for graduate study in geology must take the Graduate Record Examination Aptitude Test in sufficient time to permit consideration of the results along with the application for admission to the Graduate School.

Graduate work in geology may include investigation, under approved direction, in the field away from Ithaca.

MATHEMATICS *(ARTS)*

Professors R. P. Agnew, T. M. Chaney, W. H. J. Fuchs, L. Gal, J. K. Goldhaber, N. T. Hamilton, C. S. Herz, G. A. Hunt, M. Kac, J. Kiefer, M. E. Muller, P. Olum, H. Pollard, D. B. Ray, *J. B. Rosser,* L. A. Rubel, A. S. Shapiro, R. J. Walker.

APPROVED MAJOR AND MINOR SUBJECTS

Algebra 1, 2, 3
Analysis 1, 2, 3
Geometry 1, 2, 3
Applied Mathematics 2, 3
Mathematics 1, 2, 4

Language requirement for the Master's degree: proficiency in French or German or an approved substitute.

Prerequisites for candidacy are the equivalent of the elementary course in analytic geometry and calculus and further study in at least one more advanced subject, as, for example, differential equations, advanced calculus, modern algebra, or projective or advanced analytic geometry.

Candidates for the Master's degree are expected to attain some understanding of modern mathematical thought. Qualifications for the Doctor's degree include a broad acquaintance with the basic subjects of present-day mathematics plus a demonstration of ability to do research in one or more branches of mathematics. In addition to the more commonly recognized branches, the Department offers programs of advanced study and research in symbolic logic, in probability and statistics, and in numerical analysis and use of high-speed digital computing machines.

MECHANICAL ENGINEERING *(ENGIN.)*

Professors R. N. Allen, W. C. Andrae, T. J. Baird, R. E. Bechhofer, A. H. Burr, R. E. Clark, S. F. Cleary, B. J. Conta, D. Dropkin, G. B. DuBois, F. S. Erdman, H. N. Fairchild, N. R. Gay, B. Gebhart, R. L. Geer, G. F. Hanselman, H. Kao, I. Katz, E. V. Krick, *H. J. Loberg*, H. H. Mabie, C. O. Mackey, R. E. McGarrah, F. Ocvirk, R. M. Phelan, E. Richman, M. W. Sampson, B. W. Saunders, A. Schultz, Jr., D. G. Shepherd, R. H. Siegfried, E. B. Watson, R. L. Wehe.

APPROVED MAJOR AND MINOR SUBJECTS

Administrative Engineering 1, 2, 3, 4
Automotive Engineering 1, 2, 4
Engineering Drawing 1, 2, 3, 4
Heat-Power Engineering 1, 2, 3, 4
Industrial Engineering 1, 2, 3, 4
Machine Design 1, 2, 3, 4
Materials Processing 1, 2, 3, 4
Applied Industrial Statistics 1, 2, 3, 4
Operations Research 1, 2, 3, 4

As prerequisite for graduate study in mechanical engineering, the student should have the equivalent of the courses in his major field that are required of undergraduates in mechanical engineering at Cornell. These courses are described in the *Announcement of the College of Engineering*. Those lacking the full equivalent of this training may be required to take one or more of these undergraduate courses or to do assigned work to make up the deficiency.

There are five departments in the Sibley School of Mechanical Engineering. Graduate work is not confined to these specific departments although major and minor subjects tend to coincide with departmental titles.

Heat-Power Engineering. There are opportunities for both analytical and experimental studies at the graduate level in heat-power engineering. Opportunities for analytical studies include the fields of thermodynamics, heat transfer, combustion, fluid flow, power plants, refrigeration, and air conditioning. In the laboratories of the Sibley School of Mechanical Engineering, experimental studies at the graduate level may be made of internal combustion engines, gas turbines, steam engines, steam turbines, pumps, compressors, fans, steam generating units, heat exchange apparatus, refrigerating equipment, air conditioning equipment, and engineering instruments. By proper choice of his minor fields of study, the heat-power major may acquaint himself with closely related sciences, such as chemistry, physics, and mathematics, or with engineering courses in the other departments of the school and college.

Machine Design. Unique instruction is offered in design and related subjects

without duplication of work offered by other departments. The thesis and related courses may be concentrated in one of the following three fields or may overlap them: (1) design and development of a machine or component, (2) theoretical analysis of machine or component performance, including stress and vibration, and (3) an experimental investigation of performance. For the latter the department has its own laboratory, well equipped with the tools of experimental stress analysis, and instruments and machines of vibration analysis, bearing lubrication performance, and wear testing. Courses are offered on the subjects of creative design, automatic machinery, advanced design analysis, advanced kinematics, design problems in vibration and dynamics, oil hydraulic machinery, automotive engineering, and machine design experimental laboratory. Special interests of the staff include the lubrication and performance of bearings under high speeds and dynamic and misaligning loads, gearing, brake performance, impact stresses in machinery parts, endurance of shafts in machinery assemblies, and residual stresses. Students who major or minor in machine design usually take their other work in engineering mechanics, materials, materials processing, heat-power engineering, or industrial and engineering administration.

INDUSTRIAL AND ENGINEERING ADMINISTRATION. Study and research may take place in such areas as (1) manufacturing control, including production, quality, and cost control; (2) methods engineering, which involves motion study, elemental standards, work simplification, and aspects of incentive payment; (3) production engineering, which involves equipment selection, tooling problems, lay-out and materials handling decisions, and the definition of manufacturing flow; (4) general procedures, systems, and organizational problems; and (5) the human relations aspects involved in all of the above areas including techniques for introducing new methods to employees and other employer-employee relationships. Profitable areas for study and personal development include the solution of industrial manufacturing and distribution problems from an economic point of view, the application of the techniques emerging from recent developments in mathematical and computational equipment, and the analytical approach developing in the field of Operations Research.

A course of study in the field of Applied Industrial Statistics as related to sampling inspection, quality control, the design of engineering laboratory, pilot plant, and plant experiments and applications in the area of manufacturing operations is also available. Students without an engineering background interested in industrial statistics should refer to the offering under the Field of Statistics elsewhere in this publication.

MATERIALS PROCESSING. A general survey on the advanced level will serve as the foundation for work on individual problems dealing with the principal features and specific details of machine tools, cutting tools, machinability of materials, work and tool holding devices, and gaging and inspecting methods. The laboratory provides modern and unique facilities for measuring performance and efficiency of machines, tools and accessories, testing and inspecting of equipment and parts, experimental investigations of new methods, and participation in research projects.

ENGINEERING DRAWING. Individual attention is available to students wishing to do research and development work in industrial applications and teaching.

METALLURGICAL ENGINEERING *(ENGIN.)*

Professors M. S. Burton, J. L. GREGG, C. W. MASON, G. V. SMITH.

APPROVED MAJOR AND MINOR SUBJECTS

Metallurgical Engineering 1, 2, 4

To qualify for admission, a student must have completed satisfactorily a course substantially equivalent in its technical content to the course leading to the degree of Bachelor of Metallurgical Engineering at Cornell University. Exact equivalency,

subject for subject and credit hour for credit hour, is neither required nor expected, but the previous training must be such as to prepare the applicant for effective work in metallurgical engineering at the graduate level.

Minor subjects may be chosen, for example, from chemical engineering or other divisions of engineering, chemistry, physics, mathematics, business and public administration, or industrial and labor relations.

Candidates are expected to pursue a course of study that will give them a deeper understanding of the basic and applied sciences and will develop initiative and originality. Specific programs are planned to fit the objectives of the student and to develop original thinking. The student is not required to take any fixed series of courses; he can complete much of his graduate program through individually supervised work with members of the Faculty.

Research work for the thesis may be in specific fields of unit processes, process metallurgy, metallography, physical metallurgy, and foundry engineering.

PHYSICS *(ARTS)*

Professors L. L. Barnes, H. A. Bethe, (D. D. Clark, Engineering Physics), G. Cocconi, D. R. Corson, (T. R. Cuykendall, Engineering Physics), J. W. DeWire, C. W. Gartlein, K. I. Greisen, P. L. Hartman, D. F. Holcomb, *B. D. McDaniel*, P. Morrison, H. F. Newhall, A. W. Overhauser, L. G. Parratt, (H. S. Sack, Engineering Physics), E. E. Salpeter, (B. Siegel, Engineering Physics), A. Silverman, L. P. Smith, R. L. Sproull, D. H. Tomboulian, R. R. Wilson, W. W. Woodward, and G. B. Yntema.

APPROVED MAJOR AND MINOR SUBJECTS

Physics 1, 2, 3, 4	Theoretical Physics 1, 2, 3, 4
Experimental Physics 1, 2, 3, 4	Biophysics 3, 4

Language requirement for the Master's degree: proficiency in French or German or an approved substitute before completion of the second residence unit, or before the beginning of the third calendar-term of residence.

The major and both minor subjects for the doctorate should not be chosen inside the field of Physics.

The major subject for the doctorate may be called experimental physics only if accompanied by theoretical physics as a minor, and theoretical physics only if accompanied by experimental physics as a minor.

The major subject for the Master's degree must be in physics; the minor subject may or may not be in the field of physics.

In Physics no exceptions will be recommended to the rule that graduate assistants, whether in teaching or in research, receive only fractional residence credit.

Members of the staff are especially interested in directing graduate research in the following fields:

Experimental Physics. Nuclear and particle physics; cosmic rays; atomic and X-ray spectra; physical electronics; and physics of solids.

Theoretical Physics. Quantum mechanics; quantum theory of fields; theory of nuclei; fundamental particles; cosmic radiation; and the theory of the solid state.

A colloquium in general physics and a seminar in theoretical physics meet regularly, and seminars in special fields as arranged.

A booklet entitled *Graduate Work in Physics at Cornell* can be obtained by writing to the Chairman, Department of Physics, Rockefeller Hall. The booklet contains additional information about graduate work and research in physics for the entering graduate student.

STATISTICS *(AG., ARTS, ENGIN., I.L.R.)*

(See page 59.)

INDEX OF FIELDS OF INSTRUCTION AND APPROVED SUBJECTS


CORNELL UNIVERSITY
I WOULD FOUND AN INSTITUTION WHERE
ANY PERSON CAN FIND INSTRUCTION IN ANY STUDY
FOUNDED BY EZRA CORNELL